THE

NATURALIST:

A QUARTERLY JOURNAL OF

Natural History for the North of England

EDITED BY

W. A. SLEDGE, Ph.D., B.Sc.,

THE UNIVERSITY, LEEDS,

with the assistance as referees in special departments of

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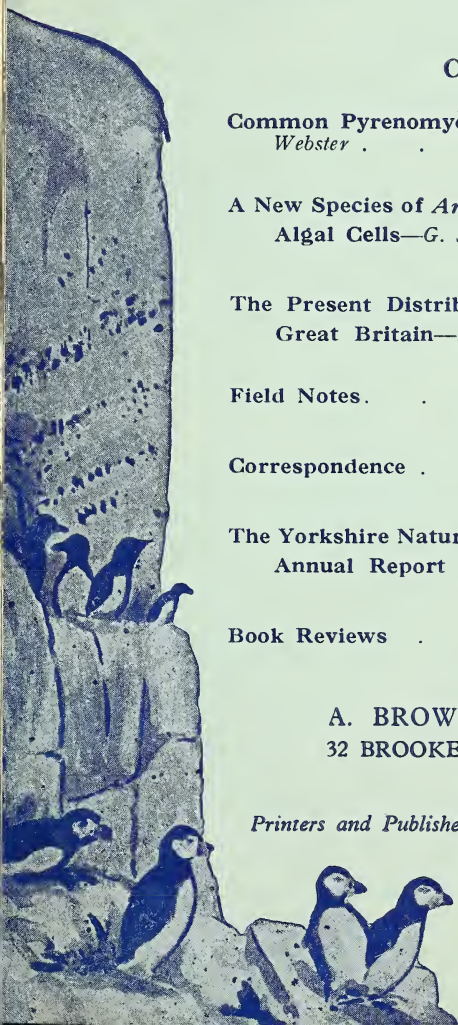

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THE NATURALIST
FOR 1953

COMMON PYRENOMYCETES OF BEECH WOOD

JOHN WEBSTER
Botany Department, Sheffield University

In recent years an increasing interest in microfungi has been noticeable among Yorkshire naturalists. The Spring forays are devoted largely to the collection of these fungi and all foray lists printed during recent years have included a high proportion of them. However, a serious obstacle in the way of an amateur wishing to study microfungi more closely is the difficulty of obtaining suitable literature with which to identify them. In no large group of fungi is the lack of British literature more keenly felt than in the Pyrenomycetes. The limited literature includes Cooke's *Handbook of British Fungi* (1871) and the admirable volumes of the brothers Tulasne entitled *Selecta Fungorum Carpologia* (1861-65) which have been translated into English. Apart from these works one must turn to papers scattered throughout various scientific periodicals, which are usually not easily available to the amateur. A useful list of British Pyrenomycetes was given by Bisby and Mason (1940). Rabenhorst's *Kryptogamenflora* Abt. II, is also a most valuable work.

Many of us recall with warm appreciation a most interesting talk and demonstration on Pyrenomycetes given by Mr. E. W. Mason at a foray in Thornton-le-Dale in 1947. The demonstration consisted of cards, on which were mounted specimens and drawings of Pyrenomycetes. It was felt that it would be most instructive to build up such a demonstration in Yorkshire. In the work recorded here the commoner Pyrenomycetes occurring on beech were collected. Specimens of about forty species have been collected and mounted.* A key to these species and descriptions of them will be found at the end of this paper.

The Pyrenomycetes are a group of Ascomycetes in which the asci are enclosed in a flask-shaped fruit body, termed a perithecium, opening to the exterior by means of a pore or ostiole. The perithecia may occur singly or may be grouped together on a mass of fungal tissue called the stroma, which may be superficial or occur beneath the bark. In the life cycle of many of these fungi secondary spore stages, the conidia, are formed. The conidial forms of Pyrenomycetes differ widely, and belong either to the Hyphomycetes or Coelomycetes.

It is interesting to study the fungus flora which develops on fallen logs and branches of beech. It is found that a fairly distinct succession of fungi can be observed. The broad outlines of the succession are probably well known. A characteristic flora develops within a few months. The fungi comprising this early flora are sometimes spoken of as fungi of first incidence. On beech this flora consists of such fungi as *Massarina eburnea, Nectria cinnabarina, Quaternaria quaternata, Anthostoma turgidum* and others. This primary flora is displaced by other fungi, some of which may persist over several years. Our knowledge is here somewhat incomplete, and a careful study by members of Natural History Societies of the flora of fallen beech trees could provide much useful information. For example, a comparison of the flora of trees which had fallen in winter with those fallen in summer would be valuable. Information regarding the time of appearance after the falling of the tree of fungi and their duration on the fallen branches would help a closer appreciation of the ecology of these fungi.

Probably very few of the fungi described can be considered as active parasites. It has been established that *Ustulina deusta* is the cause of heart rot of beech, and also of elm and lime. *Nectria cinnabarina* is frequently regarded as a weak parasite, which may enter various trees through wounds. The majority of the remaining fungi must be considered as saprophytes, playing an important part in the decomposition of tree litter.

Some of these fungi are to be found on a wide range of host plants, whilst others appear to be confined to beech or are only rarely reported on other hosts. In the

* The cards are stored in the Botany Department, The University, Sheffield, 10, and are available, on loan, to anyone interested in this group of fungi.

JAN 29 1953

former category we may include such forms as *Diatrype stigma*, *Nectria cinnabarina* and *Hypoxylon serpens*, and in the latter *Diatrype disciformis*, *Quaternaria quaternata* and *Anthostoma turgidum*. It would be of great interest to elucidate the physiological reasons underlying host specificity in these fungi. Two possibilities suggest themselves. Firstly it is possible that beech wood and bark contains special food substances which these fungi require in amounts not available in other plants. An alternative view is that a poisonous substance might be present in beech branches, which certain fungi only can tolerate. The problem is, however, a complex one, and factors of competition need to be considered. Here then, is yet another problem in need of solution.

Little detailed information is available concerning the longevity of Pyrenomycetes. Many of them can fairly be considered as perennials, with a mycelium within the wood which continues to produce fructifications over a period of years. *Xylaria polymorpha* is a fungus of this type. It has been shown that this fungus may survive and form fruit bodies for nine years on a small piece of wood.

The rate of ascospore production in certain of these fungi achieves almost incredible dimensions. Thus in *Daldinia concentrica*, which occasionally occurs on beech (although is more usually found on ash), and probably possesses the largest stroma of all British Pyrenomycetes, a single large stroma may produce several million spores.

Ingold (1946) has made a detailed investigation of spore discharge in *Daldinia*. This is dependent on an adequate supply of water. However, the stroma functions as a water reservoir, and detached stromata may continue to discharge spores for several days even when placed in a dessiccator. An interesting analogy was made between *Daldinia* and the fleshy type of xerophyte such as is found in the cacti, among flowering plants. It is possible that other Pyrenomycetes with fairly large stromata may behave in a similar manner.

The stromata of many types of the Pyrenomycetes may provide a substratum for the development of other fungi. Thus stromata of *Nectria cinnabarina* may, in the following season, bear the black cup-like perithecia of *Nitschkia cupularis*. The stroma of *Diatrype stigma* serves as a substratum for a number of similar fungi, including *Calyculosphaeria tristis*, *Chaetosphaeria phaeostroma* and *Berlesiella nigerrima*, whilst the small red perithecia of *Dialonectria sanguinea* are often to be found on the stromata of *Diatrype* and other fungi. Other associations of a similar nature may occur, but are not so obvious. Thus the dense black sheets of perithecia of *Lasiosphaeria spermoides* are only found on logs previously attacked by *Armillaria mellea*. It would be interesting to determine whether other species of *Lasiosphaeria* bear a similar relationship to basidiomycetes.

Hints on the collection and examination of specimens

When collecting wood and bark Pyrenomycetes it is advisable to carry a sharp knife with which to cut across the stromata or perithecia, especially of those fungi appearing beneath the bark. A good supply of large envelopes will be found useful in which to collect the specimens. On the envelope various details of the collection should be written, including the date, locality, host and details of the habitats. With a little practice one soon learns when these fungi are in a suitable condition for examination. If the stromata or perithecia are cut across, ripe perithecia will be seen to contain a jelly-like substance—the asci. With superficial perithecia it is sometimes more convenient to crush to expose the contents. It is rarely worth collecting material in which such contents cannot be demonstrated.

When the specimens are examined microscopically the same procedure for revealing the asci should be adopted. A portion of the perithecial contents should be placed in a drop of water ; light tapping of the coverslip will spread out the asci and ascospores. If permanent preparations are desired the perithecial contents should be mounted in lactic acid, either clear or tinted with cotton blue, heated gently, and the coverslip ringed with cement. Details of this process were described by Dade and Waller (1949).

Specimens of Pyrenomycetes on wood and bark provide excellent material for preservation. After careful drying they may be packed away and will retain indefinitely their character and may be re-examined years later. Collections of such specimens frequently have considerable scientific value. Useful advice on the keeping of herbarium specimens is given in Bisby's *Introduction to the Taxonomy and Nomenclature of Fungi* (Commonwealth Mycological Institute, 1945).

ARTIFICIAL KEY TO GENERA OF PYRENOMYCETES OCCURRING ON BEECH

1.	Spores 1-celled	2
	Spores with more than 1 cell	3
2.	Spores dark (some shade of brown or black) in colour	4
	Spores hyaline, sub-fuscous, or green in colour	5
3.	Spores dark in colour	6
	Spores hyaline, sub-fuscous or green in colour	7
4.	Perithecia in a stroma	*Xylariaceae* (P. 7)
	Perithecia single or apparently so	*Rosellinia* (VI)
5.	Perithecia in a stroma	8
	Perithecia black, cup-like, clustered	*Nitschkia* (XXII)
	Perithecia globose with conical or cylindrical necks, not cup-like	9
6.	Spores with 1 or more transverse septa only	10
	Spores with transverse and longitudinal septa	*Berlesiella* (XXI)
7.	Spores with 1 or more transverse septa only	11
	Spores with transverse and longitudinal septa	*Gloniopsis* (XXV)
8.	Spores allantoid	12
	Spores elliptical, large	*Botryosphaeria* (XV)
	Ascus containing 16 part-spores	*Chromocrea* (XXVIII)
9.	Perithecia small, with conical ostioles	*Trichosphaeria* (XVIII)
	Perithecia large, frequently hairy	13
10.	Spores with a single transverse septum	14
	Spores with more than a single transverse septum	15
11.	Spores with a single transverse septum	16
	Spores with more than a single transverse septum	17
12.	Spores hyaline	18
	Spores pale yellow or fuscous	*Diatrypaceae* (P. 13)
13.	Spores cylindrical or worm-like	*Lasiosphaeria* (XV)
	Spores elliptical	*Ceratostomella* (XVII)
14.	Septum dividing the spore into a small hyaline basal cell and a dark upper cell	*Farlowiella* (XXIV)
	Septum dividing the spore more or less equally; spores green in colour	*Chromocrea* (XXVIII)
15.	Spores 3-septate; uniformly dark in colour	*Melanomma* (XX)
	Spores 3-septate; end cells paler	*Chaetosphaeria* (XXIII)
16.	Perithecia or stromata fleshy or leathery in texture and brightly coloured	19
	Perithecia or stromata brittle in texture and black or darkly coloured	20
17.	Perithecia superficial, hairy	*Lasiosphaeria* (XV)
	Perithecia beneath the periderm	*Massarina* (XIX)
18.	Spores more than 10μ long	*Valsa* (XII)
	Spores up to 6μ long	*Peroneutypa* (XIII)
19.	Perithecia grouped together on a stroma	21
	Perithecia standing singly, not on a stroma	*Dialonectria* (XXVII)
20.	Perithecia coarsely warted	*Bertia* (XVI)
	Perithecia hairy	*Lasiosphaeria* (XV)
21.	Asci containing 16 part-spores	*Chromocrea* (XXVIII)
	Asci containing 8 2-celled spores	*Nectria* (XXVI)

SPHAERIALES :*

Perithecia and stromata black or dark in colour, carbonaceous and brittle in texture.

XYLARIACEAE :

Stromatic Pyrenomycetes usually growing on wood, often producing within the wood a black line; stromata variable in shape and size, globose, hemispherical, pulvinate, effused or cylindrical, superficial or submerged, containing few to many

* Many of the genera listed here under the Sphaeriales should properly be assigned to the Pseudosphaeriales. For details of the separation of these groups see Miller (1949).

perithecia. Ascospores dark brown to black, elliptically inequilateral, fusoid or broadly elliptical, usually with an equatorial hyaline depression.

Miller (1930, 1932) has given an account of the British Xylariaceae.

ARTIFICIAL KEY TO THE GENERA OCCURRING ON BEECH

1.	Stroma containing a single perithecium	*Rosellinia**	(VI)
	Stroma containing more than a single perithecium	2	
2.	Stroma beneath the periderm	*Anthostoma*	(VII)
	Stroma superficial	3	
3.	Stroma flat, diffuse, smooth	*Nummularia*	(V)
	Stroma, globose, hemispherical, finger-like or forming an *irregular* crust	4	
4.	Stroma club-shaped or finger-like	*Xylaria*	(IV)
	Stroma not this shape	5	
5.	Stroma large, hemispherical, containing concentric rings of tissue	*Daldinia*	(II)
	Stroma not so	6	
6.	Spores about 30μ long	*Ustulina*	(III)
	Spores less than 30μ long	*Hypoxylon*	(I)

I. *Hypoxylon :*

Stroma globose, hemispherical or flattened, leathery, woody or carbonaceous when mature, containing a few to many perithecia. Ascospores 1-celled, elliptical or inequilateral, brown or black, with a hyaline longitudinal depression in the spore wall. The young stroma at first bears conidia over its surface. The conidiophores are usually yellow-green to brown in colour, branched, and bear numerous minute unicellular conidia.

The key to species is modified from that given by Miller (1930). Petch (1938b) has given a summary of the British species of the genus.

1.	Ostiolar necks protruded beyond the ectostroma		
	(*a*) Ascospores not over 10μ in length		
	Stroma 2-4 mm. in diameter	*H. cohaerens*	(1)
	Stroma pulvinate to widely effused	*H. multiforme*	(2)
	Stroma globose to hemispherical, slightly effused on decorticated wood	*H. rutilum*	(3)
	(*b*) Ascospores over 10μ in length		
	Stroma widely effused. Spores 10-15μ in length	*H. serpens*	(4)
2.	Ostiolar necks not extruded		
	(*a*) Ascospores 10-12μ in length		
	Stroma pulvinate on bark to widely effused on decorticated wood	*H. rubiginosum*	(5)
	(*b*) Ascospores 12-15μ in length		
	Stroma bright red at maturity	*H. coccineum*	(6)

(1). *H. cohaerens* (Pers. ex Fr.) Fr.

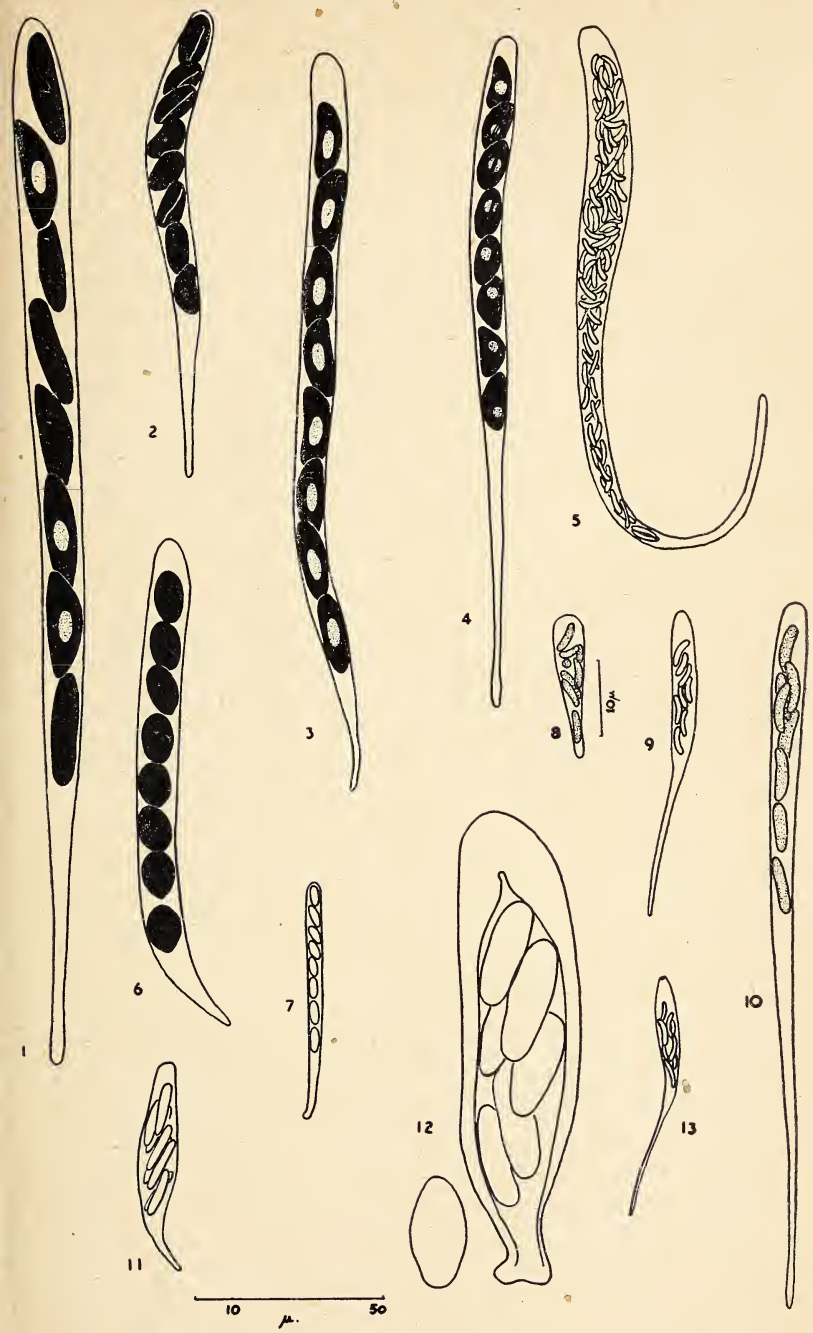
Stromata erumpent, closely crowded together and compressed, hemispherical or somewhat flattened, 2-4 mm. in diameter, purple-brown to black when mature. Perithecia numerous, opening to the exterior by means of papillate ostioles. Asci cylindrical with rounded apices and long tapering stalks ; measuring 110-200 × 6-7μ. Ascospores uniseriate, dark-brown, inequilateral ; 9·5-12 × 4-5μ. 'Common on *Fagus* . . . , doubtfully reported on other hosts.' (Miller.)

(2). *H. multiforme* (Fr.) Fr.

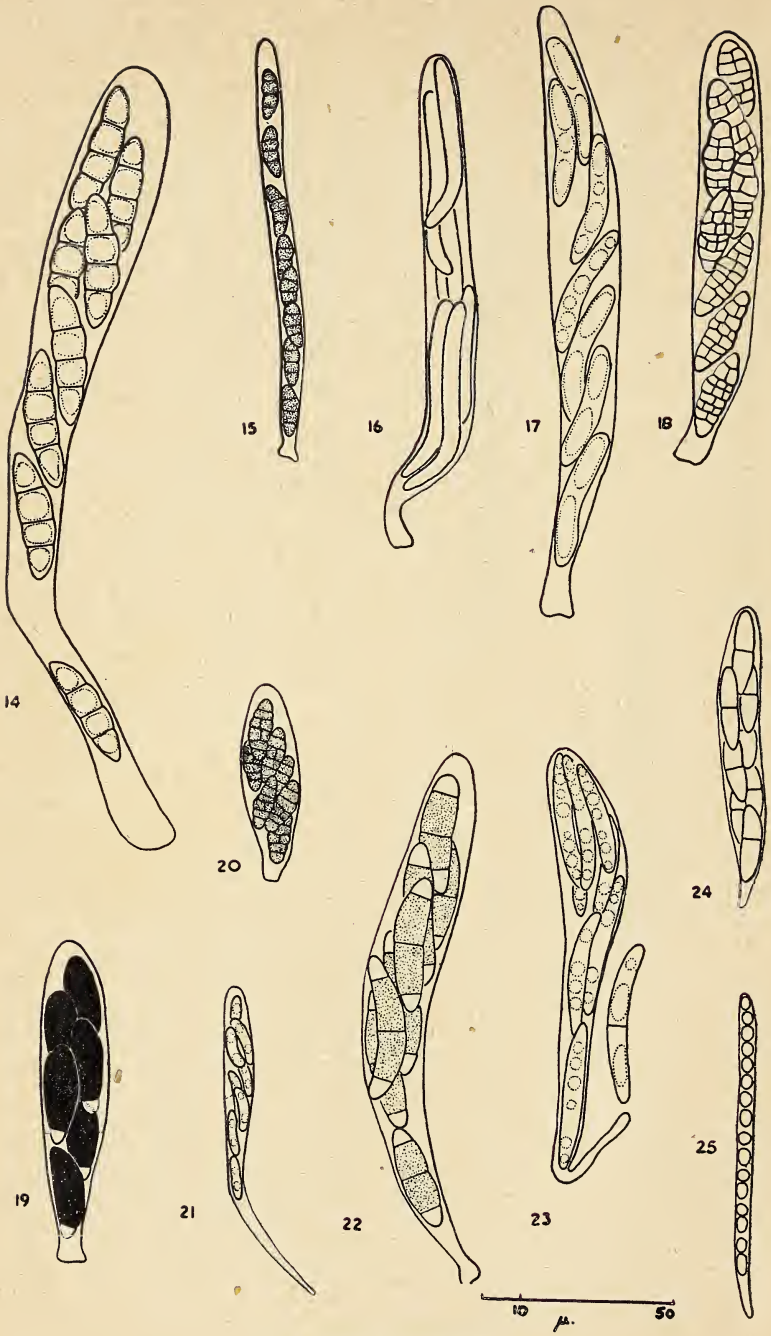
Stromata erumpent and pulvinate on bark, widely effused on decorticated wood, single or confluent 5-20 mm. in diameter or sometimes extending over several cms. ; at first pale chocolate brown in colour, becoming dark brown to black when mature. Perithecia numerous and large with distinctly papillate ostioles. Asci cylindrical with rounded apices and long tapering stalks ; measuring 120-230 × 5-6μ. Ascospores uniseriate, dark brown, inequilateral ; 8-12 × 4-4·5μ (usually 10 × 4μ).

Common on birch, but occasionally found on beech and other hosts.

† The inclusion of *Rosellinia* in the Xylariaceae is, perhaps somewhat arbitrary. Various writers had favoured its inclusion here because of the similarity of its ascospores to those of the remaining Xylariaceae. However, other authorities place it elsewhere—see Kirschstein (1934).



Key to species on page 16



Key to species on page 16

(3). *H. rutilum* Tul.

' Stroma erumpent, hemispherical, on bark 2-3 mm. in diameter and 1-2 mm. thick ; on decorticated wood irregularly effused, 3-10 mm. in diameter and 1-1½ mm. thick ; young stroma light reddish-brown, at maturity a dark shade of red, and very old specimens almost black ; perithecia very small and closely packed with minute papilliform ostiolar necks ; asci cylindrical and tapering, 50-60 × 5μ (spore-bearing part) with stalk 50-60μ in length ; ascospores at maturity inequilaterally elliptical, 7-10 × 3·3-4μ. No conidia have been observed.

Chiefly on *Fagus* but reported on other hosts. Probably limited to Europe.'

The above description is copied from Miller, since I have not collected a specimen of this fungus. It is included here since the fungus is chiefly confined to *Fagus*.

(4). *H. serpens* (Pers. ex Fr.) Fr.

Stromata flattened, smooth, irregular in size and shape, young stroma whitish, becoming purple-brown to black when mature. Perithecia few to many, large and prominent, with distinctly papillate ostioles. Asci cylindrical with rounded apices and tapering stalks ; 96-130 × 6-8μ, ascospores uniseriate, inequilateral, with obtusely rounded ends, a conspicuous central guttule and walls dark brown to black at maturity ; 11-14·5 × 4·5-5·5μ.

This fungus occurs widely, on hard woods and occasionally on coniferous woods. On beech it is usually found on old decorticated wood.

(5). *H. rubiginosum* (Pers. ex Fr.) Fr.

Stromata erumpent on bark, effused on decorticated wood, flattened, often extending over several cms. ; young stroma greenish yellow in colour (conidial) becoming brick-red or purple-brown when mature, turning black when old. Perithecia numerous, opening to the exterior by ostioles lying flush with the surface of the stroma. Asci club-shaped to cylindrical, tapering to a long stalk ; 100-150 × 8-9μ; ascospores uniseriate, dark brown with a central guttule, inequilateral ; 9-12·5 × 5-6μ.

Common on ash, but occasionally found on other hosts, including beech, in the vicinity of fallen branches of ash.

(6). *H. coccineum* Bull. Fig. 4.

Stromata erumpent, globose, or hemispherical, single or confluent, 3-8 mm. in diameter ; the young stroma is yellowish-green in colour (conidial) becoming pink and then brick-red when mature, turning brown to black when older. Perithecia numerous, prominent, opening to the exterior by non-papillate ostioles. Asci club-shaped or cylindrical with long tapering stalks and rounded apices ; 110-190 × 6-8μ ; ascospores uniseriate, inequilateral, black when mature, with a central guttule ; 12-16 × 5·5-6μ.

Common on beech, but occasionally found on other trees, e.g. birch.

The correct name for this species is *H. fragiforme* (Pers. ex Fr.) Kickx., as pointed out by Miller (1932). The use of the name *H. coccineum* Bull. can only be excused on the grounds of custom. The latter name was used by Bisby and Mason (1940).

II. *Daldinia* :

There is only one British species ;

D. concentrica (Bolton ex Fr.) Ces. & de Not. Fig. 2.

Stromata large, globose to hemispherical, smooth or sometimes irregularly folded, single or confluent, variable in size, 2·5-9 cms. in diameter, chocolate-brown, becoming black when old. Internally the stroma is differentiated into concentric zones of tissue. Perithecia numerous, in the outer layer of the stroma, penetrating to the exterior by means of small sunken ostioles. In an undisturbed atmosphere the spores issue from the ostioles in long coiled, black tendrils. Asci club-shaped, tapering to a stalk ; 100-120 × 10-11μ ; ascospores uniseriate, dark brown to black, inequilateral ; 11·5-16 × 5·5-7·5μ.

Common on ash, but occasionally found on beech.

III. *Ustulina* :

There is only one British species ;

U. deusta (Hoffm. ex Fr.) Petrak (syn. *U. vulgaris* Tul.). Fig. 1.

Stromata irregularly pulvinate or effused, spreading over several cms., at first white in colour, leathery, turning grey and finally black, becoming extremely brittle and carbonaceous when old. Perithecia numerous, large, opening by means of

papillate ostioles, asci club-shaped to cylindrical, tapering to a stalk ; 240-300 × 9-10μ. Ascospores uniseriate, fusiform, inequilateral, dark brown to black, with a single guttule ; 25-34 × 7-10μ.

At the base of old beech stumps, forming a black, irregular crust.

IV. *Xylaria* :

Stroma club-shaped or branched, differentiated into a black outer rind and a white central core, leathery in texture. Perithecia numerous, embedded in the outer layer of the fructification. Ascospores dark, inequilateral.

Petch (1939) has given notes on the British species of the genus.

There are three species commonly occurring on beech.

Growing on beech cupules	*X. carpophila*	(1)
Growing on wood		
Stroma 1 cm. or more in width usually unbranched .	*X. polymorpha*	(2)
Stroma narrower, usually branched, with a white conidial area at the apex	*X. hypoxylon*	(3)

(1). *X. carpophila* (Pers. ex Fr.) Fr.

Stromata arising from cupules of beech, thin, wiry, 2-6 cms. high, 1-2 mm. wide, usually unbranched, white at the apex where the conidia are produced, otherwise black, hairy at the base. Perithecia numerous, fairly large and prominent. Asci cylindrical or club-shaped, tapering to a stalk ; 75-110 × 6-7μ. Ascospores uniseriate, dark-brown, inequilateral ; 10-12 × 4-5μ.

(2). *X. polymorpha* (Pers. ex Fr.) Grev.

Stroma large, club-shaped or balloon-shaped, usually unbranched, arising from a narrow stalk-like base, black, rough, 1·5-5 cms. high, 1-3 cms. wide. Perithecia numerous. Asci cylindrical, tapering to a long stalk, 120-160 × 7-9μ. Ascospores uniseriate, dark-brown, fusoid, inequilateral with a single guttule ; 18-28 × 6-8μ.

On old logs of beech and various other trees.

(3). *X. hypoxylon* (Linn. ex Fr.) Grev.

Stromata cylindrical at the base, flattened above, forking at the apex which is white and powdery when the conidia are produced, otherwise black, hairy at the base, arising from a swollen disk ; 1·5-10 cms. high, 2-8 mm. wide. Perithecia large, numerous, prominent. Asci club-shaped or cylindrical, tapering to a long stalk ; 90-110 × 6-8μ. Ascospores uniseriate, dark-brown, inequilateral ; 10-14 × 4-5·5μ.

On old stumps and logs of beech and various other trees.

V. *Nummularia* :

N. bulliardi Tul. Fig. 6.

Stromata erumpent on bark, causing it to curl outwards, flat, black, shining, rounded in outline and discoid, or irregularly effused over several cms. Perithecia numerous, opening to the exterior by papillate ostioles, asci cylindrical, shortly stalked ; 110-140 × 9-10μ. Ascospores uniseriate, dark, broadly elliptical with rounded ends ; 10-15 × 7-8μ.

On branches of beech, uncommon. The description above was drawn up from duplicate specimens issued by the Commonwealth Mycological Institute. The fungus bears a superficial resemblance to *Diatrype stigma*, and it is possible that it could be mistaken for this species in the field.

VI. *Rosellinia* :

Stroma small, containing a single perithecium only, but appearing as a large perithecium. In certain forms the stroma bears stiff setae. Ascospores dark, inequilateral.

Stroma surrounded by a grey subiculum, black and smooth when mature	*R. aquila*	(1)
Stroma black and bearing stiff, short setae . .	*R. ligniaria*	(2)

(1). *R. aquila* (Fr.) de Not. Fig. 3.

Stromata at first enveloped in a grey mass of hyphae (bearing conidia), which persists around the base of the stromata ; later appearing as large perithecia, standing singly or closely grouped together, black, globose, each with a distinct papilla marking the ostiole of the single perithecium contained within the stroma (occasionally a stroma containing two perithecia may be found), about 1·5 mm. in diameter. Asci cylindrical, tapering to a stalk ; 140-220 × 9-10μ. Ascospores

uniseriate, dark brown, with a single guttule, inequilateral, with a small hyaline appendage at each end of the spore; 18-29 × 7-9μ (with occasional small spores about 13 × 5μ).

On branches of beech and various other trees, usually in rather damp situations.

(2). *R. ligniaria* (Grev.) Nits.

Perithecia small, black, single or confluent, 300-500μ in diameter, covered with short, pointed, black setae about 40μ long and 4μ wide. Asci cylindrical, shortly stalked; 100-130 × 10-13μ. Ascospores uniseriate, broadly elliptical, dark brown 14-18 × 8-12μ.

On bark and decorticated wood of beech and various other trees.

Kirschstein (1934) has transferred this species to the genus *Helminthosphaeria* on the basis of the setae covering the perithecia.

VII. *Anthostoma*:

A. turgidum (Pers. ex Fr.) Nits.

Stromata beneath the periderm, single or confluent, 1-2 mm. in diameter, raising the periderm in a series of hemispherical bulges, surmounted by a black papilla marking the position of the ostioles of the perithecia, which number 2-8 per stroma, and are arranged in a radial fashion on the stroma (this is best seen when a stroma is cut parallel to the surface of the bark). Asci cylindrical, tapering to a long stalk, 100-150 × 6-8μ. Ascospores uniseriate, dark brown, with a single guttule, broadly elliptical 8-12 × 5-8μ.

On recently dead branches of beech, raising the epidermis in characteristic hemispherical pustules.

DIATRYPACEAE:

Stromatic pyrenomycetes; stroma immersed, erumpent or superficial, containing many perithecia opening separately to the exterior by means of long perithecial necks. Asci club-shaped, usually with a long tapering tail; ascospores allantoid, yellow or fuliginous. Conidial stages various.

ARTIFICIAL KEY TO THE GENERA OCCURRING ON BEECH

1. Ascospores more than 8 in each ascus . . . *Diatrypella* (VIII)
   Ascospores 8 in each ascus 2
2. Stroma yellow when cut . . . . . *Eutypa* (IX)
   Stroma not so 3
3. Stroma containing few perithecia:
   Ascospores over 12μ long . . . . . *Quaternaria* (X)
   Stroma with many perithecia:
   Ascospores up to 12μ long. . . . . *Diatrype* (XI)

VIII. *Diatrypella*:

Stroma erumpent, containing few to many perithecia. Asci with long stalks and numerous allantoid, pale yellow or hyaline ascospores.

Croxall (1950) has shown that there are two British species of *Diatrypella*—*D. favacea* occurring on a wide range of hosts and *D. quercina* frequent on oak, but occasionally occurring on chestnut and beech. I have not collected material of the latter species on beech but have included it in the Key for completeness.

Ascospores slightly curved 6-8 × 1-2μ . . . *D. favacea* (1)
Ascospores strongly curved 8-12 × 2-3μ . . . *D. quercina* (2)

(1). *D. favacea* (Fr.) Ces. & de Not. Fig. 5. For the synonymy of this species see Croxall (1950).

Perithecial stroma erumpent, single or confluent, irregular, dark brown or black, 2-5 mm. in diameter. Perithecia numbering up to 20 in each stroma, ostioles projecting, the tips of the perithecial necks grooved. Asci long-stalked, wider at the upper end which contains the spores, 140-220 × 7-11μ; ascospores numerous, allantoid, slightly curved, pale yellow or hyaline; 6-8 × 1-2μ.

Conidial pustules frequently develop on the sides of the perithecial stromata. Croxall has shown that there are two types of conidia, long, curved, sickle shaped macroconidia, 17-40 × 1·5μ and smaller allantoid microconidia 4-10 × 1μ.

On fallen branches and trunks of beech and on various other hosts such as birch, alder and hazel.

(2). *D. quercina* (Pers. ex Fr.) de Not. ex Cooke.

This fungus is recorded rarely on beech. It is distinguished from *D. favacea* by its more cylindrical stroma and the more strongly curved and larger ascospores.

IX. *Eutypa* :

E. flavovirens (Pers. ex Fr.) Tul.

Perithecial stroma widely effused on wood, black in colour, thin, bright yellow when cut, often extending over several cms. Perithecia numerous with projecting ostioles. Asci club-shaped with long tapering stalks and broader truncate apices, 8-spored ; 80-170 × 5-8μ. Ascospores arranged at the upper end of the ascus, pale yellow in colour, allantoid ; 6-11 × 2-3μ.

On fallen branches of beech and other hosts. The fungus is superficially similar to *Diatrype stigma*, but is readily distinguished by the yellow interior of the stroma.

X. *Quaternaria* :

Q. quaternata (Pers. ex Fr.) Schroet. Fig. 10.

Perithecial stroma beneath the periderm, causing it to project in small hemispherical bulges, the perithecial necks penetrating in a group at the centre ; stromata single or confluent, about 1 mm. in diameter. Perithecia large arranged in groups of 2-5, large. Asci long-stalked broader at the rounded apices, 8-spored ; 120-200 × 8-10μ. Ascospores arranged near the upper end of the ascus, pale yellow in colour, allantoid ; 12-20 × 3·5-4·5μ.

On recently fallen twigs and branches of beech.

XI. *Diatrype* :

Stromatic Pyrenomycetes ; stroma disk-like, pustulate, or widely effused, containing many perithecia. Asci club-shaped, usually with a long stalk and a broad upper portion containing the spores, the tip truncate ; ascospores allantoid, unicellular, yellow or fuscous. Conidial stages various.

Stroma small, disk-like	*D. disciformis*	(1)
Stroma widely effused	*D. stigma*	(2)

(1). *D. disciformis* (Hoffm. ex Fr.) Fr. Fig. 13.

Stromata erumpent through the periderm, forcing it to break open in a stellate manner, disk-like flat, single or confluent, buff to dark brown in colour, 2-3 mm. in diameter, containing 30-60 perithecia. The perithecia reach the exterior by separate ostioles, opening on the surface of the stroma. Asci club-shaped, tapering to a long thin stalk wider at the upper end, truncate ; 50-70 × 4-5μ. Ascospores irregularly arranged in the upper portion of the ascus, allantoid, pale yellow in colour ; 5-8 × 1μ.

On branches and trunks of beech, rarely on other hosts.

(2). *D. stigma* (Hoffm. ex Fr.) Fr. Fig. 9.

Stromata erumpent through the periderm causing it to roll back in a characteristic manner, or on decorticated wood widely effused, applanate, smooth, often spreading over many cms., varying in colour from pale chocolate-brown to purplish-brown or almost black. On old trunks both on bark and on decorticated wood the stroma may take on another form. It becomes thick and black and produces long, grooved perithecial necks (the so-called *Eutypa spinosa* condition). Perithecia very numerous. Asci club-shaped, tapering to a long stalk, wider above, 8-spored ; 60-100 × 4-8μ. Ascospores in the upper portion of the ascus irregularly arranged, pale yellow, allantoid ; 6-8 × 1·5-2μ.

Macroconidia emerge in golden-yellow tendrils, and are fusoid, slightly curved, hyaline, and measure 13-16 × 1μ. The microconidia also emerge in orange tendrils and are cylindrical or allantoid, hyaline, and measure 4-6 × 1μ.

On branches and trunks of beech and numerous other hosts. One of the most common of British Pyrenomycetes.

XII. *Valsa* :

V. ambiens (Pers. ex Fr.) Fr. Fig. 11.

Perithecial stromata developing beneath the periderm and causing it to project as hemispherical bulges, with the perithecial necks projecting in the centre occasionally through a slit in the periderm. Perithecia arranged in a ring around the edge

of the stroma, about 7-15 in number. Perithecial wall black with white glistening contents when ripe. Asci broadly club-shaped, sessile or very shortly stalked, with truncate apices; 38-52 × 8-10μ. Ascospores allantoid, hyaline; 10-12 × 3-4μ.

I have not collected this fungus in its conidial stage on beech. Grove (1935) states that *Cytospora ambiens* is the conidial stage. The sausage-shaped spores are 5-7 × 1μ and emerge in white or yellowish tendrils from sub-epidermal conidial stromata.

On branches of beech and on numerous other hosts.

XIII. *Peroneutypa*:

P. heteracantha (Sacc.) Berl. Fig. 8.

Perithecial stroma developing beneath the periderm, causing it to crack open by triangular or slit-like fissures to reveal the stroma, which is black in colour and up to 1 mm. in diameter, containing 2-8 perithecia. The perithecial necks are cylindrical and truncate and project above the surface of the stroma. Asci club-shaped, shortly-stalked with truncate apices, 8-spored; 40-50 × 6-8μ. Ascospores allantoid, hyaline; 4-6 × 0·75-1μ.

On twigs and branches of beech and other hosts.

XIV. *Botryosphaeria*:

B. hoffmanni von Höhnel. Fig. 12.

Perithecial stromata developing beneath the periderm, single or confluent, erumpent, breaking through the periderm by means of triangular fissures, black, 1-1.5 mm. in diameter. Perithecia compressed, 4-12 in each stroma, with white contents. Asci surrounded by numerous paraphyses, broadly oblong to cylindrical, with rounded apices and short truncate stalks at the base, 2-8 spored; 100-150 × 20-30μ. Ascospores oblong or occasionally drawn out at the ends, with 1-3 large guttules, hyaline; 26-40 × 12-20μ.

The fungus is associated with a pycnidial form, *Fusicoccum macrosporum* Sacc. & Bri. which is probably the conidial stage. The conidial pustules resemble the perithecial stromata but contain up to 50 smaller locules with white contents. The pycnospores are oblong elliptical and measure 34-50 × 11-14μ.

On periderm of fallen branches of beech.

XV. *Lasiosphaeria*:

Perithecia single, usually globose, thin-walled, superficial, clothed with long hairs. Asci club-shaped; ascospores cylindrical at first hyaline, later becoming brownish, with several transverse septa. In certain species septa are frequently not visible.

ARTIFICIAL KEY TO SPECIES ON BEECH

1.	Perithecia apparently lacking hairs, but surrounded by a few stiff black hairs at the base . . .	*L. spermoides*	(1)
	Perithecia completely covered with hairs except around the ostiole	2	
2.	Perithecial hairs black	*L. hirsuta*	(2)
	Perithecial hairs golden-brown	*L. strigosa*	(3)
	Perithecial hairs white	*L. ovina*	(4)

(1). *L. spermoides* (Hoffm. ex Fr.) Ces. & de Not.

Perithecia black, superficial, globose or rather taller in longitudinal than in transverse diameter, 0·5-0·8 mm. in diameter, closely clustered together in a dense stratum; surrounded at the base by stiff black hairs. Asci club-shaped, tapering to a short stalk and rounded at the apex, 8-spored; 120-160 × 10-12μ. Ascospores cylindrical or allantoid, with rounded ends, occasionally slightly constricted in the middle, guttulate, at first hyaline, later yellow to pale brown in colour, at length becoming 1-septate; 20-24 × 3·5-5μ.

On old fallen wood and bark of beech and other trees, apparently always associated with *Armillaria mellea*.

(2). *L. hirsuta* (Fr.) Ces. & de Not.

Perithecia superficial, globose, black, gregarious, 500-600μ in diameter, seated on a subiculum of stiff black hyphae. Perithecial wall thin, clothed with numerous stiff, black, septate, tapering hyphae up to 300μ in length and about 4μ wide;

perithecial contents white in colour. Asci club-shaped with short stalks, 8-spored ; 150-180 × 14-18μ. Ascospores cylindrical or somewhat curved, rounded at the upper end, tapering towards the lower end, at first hyaline and guttulate later becoming pale brown and containing up to 6 transverse septa ; 60-70 × 6-8μ.

On old wood of beech and various other hosts.

(3). *L. strigosa* (Alb. & Schw. ex Fr.) Ces. & de Not. Fig. 17.

Perithecia superficial, globose, somewhat pointed at the ostiole, golden-brown in colour, gregarious, 500-600μ in diameter, thin-walled, clothed with numerous thick-walled, smooth, pointed golden hyphae up to 350μ long and 10-14μ wide. Asci club-shaped with a short stalk, tapering to the rounded apex ; 110-156 × 12-15μ. Ascospores cylindrical or allantoid with rounded ends, at first hyaline and guttulate, later pale brown in colour ; 30-42 × 6-7μ.

On old wood of beech and various other hosts.

(4). *L. ovina* (Pers. ex Fr.) Ces. de Not. Fig. 16.

Perithecia superficial, gregarious or scattered, globose with a small conical papilla at the mouth, 400-600μ in diameter, black, thin-walled, surrounded by a white sheath of branched hyphae ; the mouth of the perithecium projects beyond the sheath as a black papilla, and in old perithecia the hyphae frequently disappear or surround the bases of the perithecia only. Asci club-shaped, stalked, tapering to the truncate apices, 8-spored ; 160-200 × 4-16μ. Ascospores worm-like, cylindrical or curved, with a rounded upper end and tapering at the lower end, which is usually bent ; at first hyaline and guttulate, later becoming yellow in colour ; 44-54 × 4-6μ.

On old wood of beech and various other hosts.

XVI. *Bertia* :

B. moriformis (Tode ex Fr.) de Not. Fig. 23.

Perithecia superficial, gregarious, cylindrical, black, coarsely warted, 600-800μ in diameter, fairly thick-walled, perithecial contents white. Asci broadly club-shaped, tapering to long stalks, with rounded apices ; 115-140 × 12-18μ. Ascospores allantoid, tapering at each end, hyaline, guttulate, at maturity containing a single median transverse septum ; 40-48 × 5-7μ.

On old wood of beech and various other hosts.

XVII. *Ceratostomella* :

C. cirrhosa (Pers. ex Fr.) Sacc.

Perithecia single or grouped together, half-sunken in the wood, with the cylindrical necks projecting ; black, surrounded at the base by black branching stiff hyphae, about 4μ in width ; perithecia measuring 800-1000μ in diameter. Asci club-shaped, tapering to a stalk at the base and rounded at the apex ; 65-84 × 7-9μ. Ascospores uniseriate or biseriate above, uniseriate below, elliptical, unicellular, hyaline, with 1 or 2 guttules ; 9-12 × 3·5-4μ.

On old wood of beech and various other hosts.

XVIII. *Trichosphaeria* :

T. myriocarpa (Fr.) Petrak & Sydow. Fig. 7.

Perithecia superficial, single or gregarious, black, smooth, globose, small, somewhat pointed at the ostiole, 150-200μ in diameter. Asci cylindrical shortly stalked, 8-spored ; 46-56 × 4-5μ. Ascospores uniseriate, elliptical or shortly cylindrical with rounded ends, hyaline, guttulate ; 5-6·5 × 2-3μ.

On old wood of beech and various other hosts.

XIX. *Massarina* :

M. eburnea (Tul.) Sacc. Fig. 14.

Perithecia single or in small groups beneath the periderm, raising it very slightly, walls black, contents white, necks very short or absent ; when in groups the perithecial walls are often compressed laterally ; perithecia measuring 500-800μ in diameter. Asci broadly club-shaped, shortly stalked and with tapering, rounded apices, 8-spored ; 140-180 × 20-22μ. Ascospores irregularly biseriate, hyaline, with 3-4 prominent guttules, and 3 transverse septa, walls constricted at the septa 28-38 × 10-12μ.

On recently dead twigs of beech ; rather inconspicuous.

XX. *Melanomma* :

Perithecia superficial, black, carbonaceous. Ascospores dark, transversely septate.

Chesters (1938) has studied two British species, *M. pulvis-pyrius* and *M. fuscidulum*, both of which occur on beech. Although I have only collected the first of these species on beech, a brief description of the second is included for completeness.

Ascospores uniseriate, 13-17 × 4-6μ . . .	*M. pulvis-pyrius*	(1)
Ascospores biseriate, 12-16 × 3-4μ . . .	*M. fuscidulum*	(2)

(1). *M. pulvis-pyrius* (Pers. ex Fr.) Fuckel. Fig. 15.

Perithecia superficial, gregarious, black, sub-globose or rather irregular in shape, occasionally beaked, usually with a conical papilla containing the ostiole, perithecial wall frequently grooved longitudinally; 400-500μ in diameter. Asci cylindrical, stalked, rounded at the tips, 8-spored; 96-120 × 7-8μ. Ascospores uniseriate, light brown, with 3 transverse septa, curved, the second cell somewhat enlarged, walls slightly constricted at the septa; 14-17 × 5-6μ.

On old wood of beech and various other hosts.

(2). *M. fuscidulum* Sacc.

Perithecia superficial or erumpent through the periderm, globose with a conical, neck. Asci cylindrical-clavate, shortly stalked; 54-101 × 6-8μ. Ascospores biseriate, dark, 3-septate; 12-16 × 3-4μ. (Chesters, 1938.)

On beech and various other hosts.

XXI. *Berlesiella* :

B. nigerrima (Bloxam ex Currey) Sacc. Fig. 20.

Perithecial stromata superficial, black, carbonaceous, granular, cushion-like or rather more widely effused, occasionally extending for 2 mm. or more; bearing numerous small, black, globose perithecia each about 100μ in diameter. Asci sessile, elliptical, 8-spored; 52-70 × 12-14μ. Ascospores irregularly biseriate, dark, guttulate, with 3-5 transverse septa and 1 or 2 longitudinal septa in the broader middle cells, slightly rounded; 16-18 × 5-6·5μ.

On stromata of *Diatrype stigma* on various hosts.

XXII. *Nitschkia* :

N. cupularis (Pers. ex Fr.) Karst. Fig. 21.

Perithecia closely clustered together, erumpent through the bark, black, rough. elongated vertically; later the upper portion of the perithecial wall collapses so that the perithecium becomes cup-like, the whole perithecium then being top-shaped; 300-400μ in diameter. Asci club-shaped, broader at the rounded upper end, tapering to a stalk below; 60-84 × 7-8μ. Ascospores multiseriate in the broader part of the ascus, uniseriate below, unicellular, hyaline, straight or slightly curved; ends rounded, with 2 small guttules; 8-12 × 2·5-3μ (9-16 × 2μ by Fitzpatrick, 1923),

On old stromata of *Nectria cinnabarina* on various hosts.

XXIII. *Chaetosphaeria* :

C. phaeostroma (Dur. & Mont.) Fuckel. Fig. 22.

Perithecia dark, black, globose, closely crowded, seated on a subiculum, composed of black branching hyphae, perithecial wall clothed at the base with long pointed black setae about 400μ long and 10μ wide. Asci club-shaped, shortly-stalked, 8-spored; 100-140 × 18-21μ. Ascospores biseriate, somewhat curved, 3-septate, the end cells smaller and hyaline, the two middle cells, dark; 22-38 × 6-8μ.

On old wood and bark of beech and various other hosts, frequently associated with *Diatrype stigma*.

HYSTERIALES :

Fruit bodies (hysterothecia) elongate and boat-like, opening at maturity by means of a longitudinal slit. Certain authorities assign this group to the Discomycetes. Others, e.g. Bisby & Mason (1940), have included them in the Pyrenomycetes. Bisby (1941, 1944) has described the British species of this group.

XXIV. *Farlowiella* :

F. carmichaeliana (Berk.) Sacc. Fig. 19.

Hysterothecia superficial, black, elongate, up to 1 mm. long and 0·3-0·4 mm. wide, opening by a longitudinal slit. Asci broadly cylindrical or club-shaped,

surrounded by numerous paraphyses, shortly stalked, rounded at the apices, 8-spored; 70-90 × 15-20μ. Ascospores biseriate, inequilateral, divided by a transverse septum into a large upper dark brown cell, and a small hyaline basal cell (apiculus), the whole spore measuring 20-25 × 9-10μ.

Mason (1941) has shown that the conidial stage is a Hyphomycete, *Monotospora megalospora* Berk. & Br. This fungus is often associated with *Sporocybe flexuosa* (Mass.) Mason, and both fungi are often collected with *Farlowiella*. The *Monotospora* conidiophores are stiff, black and upright, and bear at their apices black, obovate, unicellular conidia measuring 20-30 × 18-24μ.

On old damp wood of beech and various other hosts.

XXV. *Gloniopsis*:

G. levantica Rehm. Fig. 18.

Hysterothecia superficial, single or confluent, black, elongated, straight or sinuous, opening by a longitudinal slit, the lips of the hysterothecia are frequently furrowed; up to 1·5 mm. long and 0·5 mm. broad. Asci broadly cylindrical or club-shaped, rounded at the apices, 8-spored; 90-100 × 15-16μ. Ascospores irregularly biseriate, hyaline, guttulate, with 5-7 transverse septa and 1 or more longitudinal septa in the middle cells, constricted at the insertion of the transverse septa, wider in the middle, tapering towards the undivided, rounded, end cells; 22-28 × 9-10·5μ.

On old wood of beech and various other hosts.

Hypocreales:

Perithecia and stromata fleshy or leathery and usually brightly coloured (white, yellow, red or violet), superficial or immersed.

Petch (1938a) has described the British members of this group.

XXVI. *Nectria*:

Perithecia superficial on an erumpent, brightly coloured stroma. Asci 8-spored; ascospores hyaline, 1-septate.

Perithecia up to 400μ in diameter, wall rough	*N. cinnabarina*	(1)
Perithecia up to 300μ in diameter, wall smooth	*N. coccinea*	(2)

(1). *N. cinnabarina* (Tode ex Fr.) Fr. Fig. 24.

Perithecia clustered on an erumpent stroma, bursting through the periderm, orange-red or dark red in colour, globose, up to 400μ in diameter, perithecial wall rough, ostiole not markedly projecting. Asci club-shaped, sessile; 70-94 × 10-13μ. Ascospores irregularly biseriate, 2-celled, hyaline, slightly constricted at the septum, tapering and rounded at the ends; 14-20 × 5-7μ.

Conidial pustules are salmon-pink in colour, erumpent, cushion-like, up to 3 mm. in diameter, producing cylindrical slime-spores; 6-8 × 2-3μ.

On twigs and branches of beech and many other host plants.

(2). *N. coccinea* (Tode ex Fr.) Fr.

Perithecia clustered together, seated on an inconspicuous stroma, erumpent through the bark, occasionally scattered, dark-red when mature, globose, with a distinct pointed ostiole, smooth-walled, 250-300μ in diameter. Asci cylindrical or club-shaped, truncate at the apices, shortly stalked, 84-110 × 10-12μ. Ascospores uniseriate, or irregularly biseriate above, uniseriate below, 2-celled, hyaline, guttulate, elliptical, slightly or not constricted at the septum, 12-15 × 6-7μ (12-19 × 5-7μ by Petch).

On trunks of beech and various other hosts.

XXVII. *Dialonectria*:

Perithecia brightly coloured, standing singly, not grouped on a stroma; ascospore bicellular.

Perithecia bright red, small, up to 250μ in diameter	*D. sanguinea*	(1)
Perithecia yellowish-orange, up to 450μ in diameter	*D. peziza*	(2)

(1). *D. sanguinea* (Bolton ex Fr.) Cooke.

Perithecia single, small, globose with a conical ostiole, dark red when mature, smooth, collapsing and becoming flattened laterally on drying; 150-250μ in diameter. Asci cylindrical or narrowly club-shaped, apices truncate, shortly stalked

or sessile; 60-75 × 5-8μ. Ascospores uniseriate, or biseriate above and uniseriate below, 2-celled, hyaline, elliptical, slightly or not constricted at the septum; 7-11 × 4-5μ (9-14 × 4-6μ by Petch).

On old stromata of other fungi such as *Diatrype*, *Anthostoma*, etc., on various hosts.

(2). *D. peziza* (Tode ex Fr.) Cooke.

Perithecia superficial, gregarious or scattered, at first globose, later collapsing at the apex and becoming cup-like, yellow to orange in colour, pruinose, surrounded at the base by white delicate hyphae; perithecia 300-450μ in diameter. Asci cylindrical or club-shaped, shortly stalked; 60-90 × 7-9μ. Ascospores uniseriate, or irregularly biseriate above, uniseriate below, elliptical or cylindrical with rounded ends, 1-septate, not constricted at the septum, hyaline; 8-15 × 5-7μ (usually 11-14 × 5-6μ).

On rotten wood and bark of various trees and on *Polyporus squamosus*.

XXVIII. *Chromocrea*:

C. gelatinosa (Tode) Seaver. Fig. 25.

Stromata cushion-like, single or confluent 1-3 mm. in diameter, tuberculate, gelatinous, yellow to brown in colour, translucent, the green colour of the perithecial contents being visible; hard and wrinkled when dry. Perithecia numerous, embedded in the outer part of the stroma, ostioles rather prominent. Asci cylindrical, shortly stalked, rounded at the tips; 80-86 × 4-4·5μ. Ascospores uniseriate, at first 2-celled, later breaking up so that the ascus contains 16 part-spores, the upper globose, about 4μ in diameter, the lower elliptical 5-6 × 3-4μ, dark green, echinulate.

On old wood and bark of beech and various other hosts.

I should like to express my sincere thanks to all who have helped in the preparation of this paper.

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Since this paper was written an account of the succession of fungi on decaying branches has been given by Chesters. (Chesters, C. G. C., 1950. On the succession of microfungi associated with the decay of logs and branches. *Lincolnshire Nat. Union Trans.*, **12**, 129-135). Many of the fungi described here are photographed.

A NEW SPECIES OF *ARTHOPYRENIA* WITH BLUE-GREEN ALGAL CELLS

G. SALISBURY

Arthopyrenia subareniseda n. sp. Thallus effusus, tenuissimus, pallidus, leviter gelatinosus. Perithecia minuta, nigra, globoso-conica, semi-immersa, integra. Sporae mediocres, oblongo-ovoideae, 1-septatae.

Thallus effuse, very thin, greyish or yellowish, rarely darker, somewhat gelatinous, usually obscured by a limey deposit producing a bubbling in HCl. Algal cells blue-green, or appearing yellowish, subglobose to cylindrical, 6-7·5 × 3-4μ, surrounded by thick yellowish mucilage-envelopes; hyphae 1·5-2μ thick, colourless.

Perithecia scattered, black, globose-conical, 0·08-0·15(0·2) mm. diam., semi-immersed, the wall entire, 15-20μ thick all round, black and carbonaceous. Periphyses none or very scanty. Hypothecium 30-40μ high, not cellular. Paraphyses numerous,

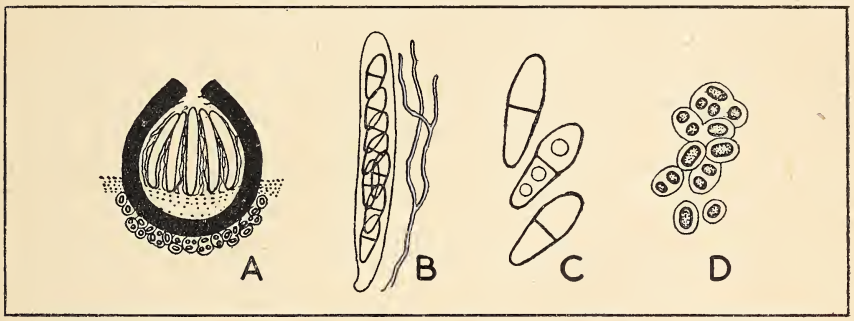

Fig. 1. ***Arthopyrenia subareniseda*** **G. Salisb.**
A. Perithecium × 150; B. Ascus and paraphysis × 400; C. Spores × 800
D. Algal cells × 400.

persistent, as long as asci, 1-1·5μ thick, branched and entangled. Asci, 70-100 × 13-14μ, subcylindrical. Spores 8, biseriate, or partly uniseriate, colourless, oblong-ovoid, 1-sep., the upper cell slightly thicker, 0-1-2 guttules in each cell, 15-19 (21) × 5-7μ. Hymenial gelatine and asci not coloured, the spores yellow, with iodine.

S. Lancs. (V.C. 59): Ainsdale dunes, on damp sandy soil in slacks, January and May 1950, G. Salisb. (No. 68).

Near to *A. areniseda* A. L. Sm., and resembling f. *minor* except that the asci and spores are little more than half the size so it is kept distinct. Other differences in the description by A. L. Smith (*Brit. Lich.* 2: 355, 1926) are explained below.

A. areniseda was also originally detected in the same locality by Wheldon, 1905-6, and still occurs. The only other record is by Wheldon and Travis (in Lich. S. Lancs., *J. Linn. Soc.* (*Bot.*), 1915) from similar habitats at Hoylake (V.C. 58). A doubtful record from Mochras (V.C. 48) by Watson (Lich. Notes 7, *J. Bot.*, 1933) should be ignored as no apothecia were noticed and similar incrustations may not even be lichenoid. The character described by A. L. Smith as ash- or whitish-grey, granular and somewhat furfuraceous and by Wheldon and Travis as resembling a greyish efflorescence is due to a limey deposit commonly occurring in slacks where water is present (shown by treatment with HCl). The thallus as in *A. subareniseda* is better described as gelatinous.

A. L. Smith described *A. areniseda* with algal cells *Trentepohlia*, but this is a mistake. They are identical with those in *A. subareniseda* identified by Dr. J. W. G. Lund (Windermere) as *Gloeothece rupestris*, a blue-green alga. Other species also contain blue-green algae instead of the more usual *Trentepohlia*, which is not a marine alga. The marine *Arthopyrenias* have been studied by Feldman (*Rev. Bryol. et Lichénol.* 10: 64-73, 1937), who found *Mastigocoleus testarum* (Stigonemataceae) in *A. litoralis*, and *Gloeocapsa crepidinum* in *A. leptotera* and *A. halodytes*, the latter also given by Bornet and noted by A. L. Smith.

A. areniseda and *subareniseda* occur in freshwater situations not far from the sea (damp, sandy shores according to A. L. Smith). *A. argilospila* A. L. Sm. from wet

sandbanks near Shrewsbury given by Crombie (*Brit. Lich.* 1: 30, 1894) under *Magmopsis* with algal cells syngonimia (blue-green) was transferred to *Arthopyrenia* by A. L. Smith, who considered that the blue-green algae grew over the surface of the lichen but according to my examination (specimens in Herb. Brit. Mus. and Kew) the same algae also occurred under the perithecium and no *Trentepohlia* was present.

The question of the systematic position of these species in view of the different algae raises too many other important questions to be dealt with here. *Arthopyrenia* has algal cells of *Trentepohlia*. Keissler (in Rabenh. *Krypt. fl.* 9, 1/2, 1937) drew attention to many mistakes and transferred the species with blue-green algae to widely-separated genera. Many lichenologists, however, now consider that the algal cells ought not to be used for the separation of genera as in the system of Zahlbruckner and the species have been left under *Arthopyrenia*.

Hydrography in Relation to Fisheries, by **John B. Tait.** The Buckland Lectures. Pp. xii+106, with 19 figures. Edward Arnold & Co. 7/6.

In spite of its small size, this book is a mine of information and of intense interest to the present writer. All those who are interested in natural waters, fresh as well as sea, in fisheries, in the relations between organism and environment, in the stimulating presentation of a sketch of a long and involved piece of work, will enjoy this set of lectures and profit from them.

Knowledge of the sea is rapidly increasing through continued attempts to study its nature without reference to the practical value of the results gained and through the need to know the conditions which govern the state of fisheries in different parts of the world. It is well enough understood that there is no ultimate difference in the kind of information so acquired, but merely in the purpose. Dr. Tait's book shows very clearly these aspects of the sea, seen by a worker who regards the problem as a whole and at the same time as having interests of a purely economic nature. Other Buckland Lectures have been concerned with particular animals, or with conditions of exploitation; these deal with the medium of existence of the animals (and plants)—the solution, the temperatures, the currents, the effects of conformation of the ocean bed on currents, all acting on the organisms living therein.

The scene of the story is chiefly the northern part of the North Sea, west of Norway towards and including the Faroë region, at times extending round the British Isles, to Greenland, to North America, to the southern oceans, as when discussing, for instance, vertical circulation in the South Atlantic Ocean. The material and the treatment have the character of the universal while being considered in relation to a locality. Illustrations in the form of maps and plottings are sufficiently numerous.

Only two adverse comments are made. There is no index, which is rather a disadvantage in reference, and my chemical friends think that the caption to table 7 should read ' 1000 grammes.'

E.P.

Handbooks for the Identification of British Insects. Published by the Royal Entomological Society of London, September 5th, 1952.

Vol. VI, part 2 (b). Hymenoptera Symphyta. Section (b). By **R. B. Benson.** Pp. 51-137, ff. 128-340. 15/-.

Vol. V, part 12. Coleoptera Cerambycidae. By **E. A. J. Duffy.** Pp. 18, ff 32. 3/6.

Mr. Benson continues his admirable revision of the British sawflies, dealing with the largest family, the Tenthredinidae, except for the subfamily Nematinae which is to appear later as ' Section C.' This long awaited work is more than an ordinary synopsis since it embodies much original research resulting from many years careful study of the group. The brief biological data and distributional notes are carefully prepared and add greatly to the value of the handbook.

In dealing with the Cerambycidae (Longhorn Beetles) Mr. Duffy has very wisely included not only our British species but a number of the more usual importations which frequently occur in timber. In two respects this part is unsatisfactory; the generic names used are printed throughout without authorities and information on the distribution of the British species is almost entirely omitted.

W.D.H.

THE PRESENT DISTRIBUTION OF THE ROE DEER IN GREAT BRITAIN

HENRY TEGNER

The Roe Deer, *Capreolus capreolus*, is found from Portugal in the west to Korea in the east, and from Norway and Finland in the north, to Persia in the south. They do not occur south of the 30th Parallel nor do they exist in North or South America. Their habitat is, therefore, all that part of the Old World which stretches from the Atlantic in the west to the Pacific in the east. The Arctic Ocean confines them to the north. The Arabian Sea and the mountains of the Himalaya are their southernmost boundaries.

In the British Isles, roe are now found from the far north of Scotland to the southern English counties of Dorset and Wiltshire. Roe occur in Wales and in Norfolk in fact, to-day one may come across roe deer anywhere on the mainland of Britain. Roe were introduced to certain parts of Ireland, but they are now extinct. The roe was never an indigenous Irish mammal.

In Scotland, it would appear that, north of a line drawn through the big cities of Glasgow and Edinburgh, roe deer have always maintained a fair head of population. The straths of Spey, Don, Dee and Tay are the breeding grounds of many roe. In most wooded districts, and particularly in the sheltered valleys of the bigger Scottish rivers, roe have sheltered and survived. They never became extinct, as they appear to have done in other parts of Britain, and particularly in southern England and in Wales. Thanks, however, to the various re-introductions, roe have increased again in England and I believe also in certain of the Welsh counties.

In 1780 a number of Perthshire roe deer were caught and transferred in padded horse coaches to Milton Abbas in Dorset. Lord Dorchester was responsible for this introduction. The experiment proved an undoubted success, as the deer, after their arrival in the south of England, quickly became acclimatised and began to thrive in their new surroundings.

Prior to this period the population of roe deer appears to have dwindled to a very marked extent, both in Wales and in the greater part of England, although they seem to have held their own north of the Edinburgh-Glasgow line. Written evidence on this partial extinction of roe in England and Wales is exceedingly scanty, but what does exist leads one to believe that they were a rarity outside Scotland.

There is, I think, very considerable doubt as to whether roe became entirely extinct in England, as some natural historians would have us believe. The literature on roe is not by any means voluminous and the scanty references available merely touch on the subject of these deer. When observed, they are given but a casual reference, consequently it is possible that roe may have survived in certain parts of England since pre-historic times. Big woodlands, such as the New Forest and nearby Cranbourne Chase, may conceivably have afforded shelter to at least a remnant of these deer who have succeeded in breeding, in the concealment of these sanctuaries, in spite of perpetual persecution, throughout the centuries.

The re-establishment of the roe deer throughout the British Isles appears to have started with the artificial re-introductions first carried out by Lord Dorchester at Milton Abbas.

As a result of the success of this experiment, subsequent transfers from Milton Abbas took place. A number of these roe were taken by Mr. Drax to the Charborough woods, from whence their offspring have spread into the Hyde and Bere woodlands. The roe now extant in Petworth in Sussex are the descendants of deer imported from Dorset by Lord Egremont. The park in which they were originally placed contains a large amount of woodland. The stone wall enclosing this land extends for many miles and the first impression the observer gets of this park is its immense area. There is no sense of enclosure—this is perhaps the main reason why these deer have done so well there. When I last visited Petworth the walls of the park had crumbled in a number of places and a roe wishing to leave could do so without difficulty. Roe nowadays are not infrequently seen in a completely wild state in the county of Sussex in all probability originated from the Egremont introduction.

Edward North Buxton, an eminent naturalist, in 1884, with the help of two Dorset landowners, namely Mansell Pleydell and Charles Hambro, succeeded in

introducing a number of roe to Epping Forest. Buxton's grandson, the present E. N. Buxton, now Senior Verderer of the Forest, has very kindly sent me an extract from his grandfather's book, *A Guide to Epping Forest*. As this is of considerable interest to the present-day naturalist, I am taking the liberty of quoting in full the extract, which specifically refers to the capture and transfer of these Dorset roe deer to Epping:

> 'Its success was largely due to Mr. J. E. Harting, who took a naturalist's interest in the venture and who not only superintended the capture, but accompanied them in their long journey through the night to Loughton. The capture was effected by long nets stretched across the wood, the deer being driven towards them by beaters and secured when entangled in the meshes and carefully placed in a covered deer van. In this way eight were taken but, two being destined for the Zoological Gardens, only six—two bucks and four does—were enlarged in their new home. Owing to the careful provisions which were made by Mr. Porter, an experienced deer catcher, no hitch occurred and when the door of the van was opened the next morning in the thickest part of the Forest, each one bounded out sound in limb and, after one stare of surprise, made off at its best pace into the cover. Subsequently I myself superintended a further capture and placed eight more in the Forest. They and their progeny were for many years an added charm to the life of the Forest. To my great regret they have now almost disappeared.'

Although the author of this account does not give his opinion as to why these Epping roe became extinct, his grandson, the present Mr. E. N. Buxton, tells me that he considers the reason for their disappearance to be the lack of sufficient dense cover in the Forest, and with this view I am in entire accord. Roe will not thrive unless they have a sufficiency of thick undergrowth or warm woodlands to resort to. Incidentally, Mr. Buxton does qualify this apparent disappearance by remarking that he is himself not quite certain that all descendants of the introduced Dorset roe are dead in the country around. On occasion, he has received unauthenticated reports, since the end of the 1914-18 war, that roe deer have been seen in the neighbourhood. However, during the inter-war period, many of the Essex private parks which held fallow deer, were broken up, thus releasing, in a number of instances, park, fallow deer throughout the county. To the inexperienced observer, these semi-feral fallow might easily be mistaken for roe.

In most instances, the transfer of roe deer from one place to another, in order to introduce a new wild mammal to the district or to bring in new blood where they already exist, has been done within the British Isles. There is one instance on record, however, where roe deer from Germany have been enlarged in Britain.

Frank Wallace, in his book *Hunting and Stalking the Deer*, quotes a letter from Mr. Assheton Smith from Vaynol, North Wales, written in 1902. This says:

> 'I have had roe here for many years—in fact since 1874. The only thing I have to complain of is that a good many are poisoned through eating yew, of which there is unfortunately a great quantity in these woods. They range all through the park, as there are only wire fences, through which they creep. They keep to the woods chiefly and are seldom seen in the open. I got some of the first from Germany and have others from Dorsetshire.'

This is interesting, as it is the only record I know of where roe have been introduced artificially from the Continent and have successfully acclimatised themselves as wild animals.

The grandfather of the Mansell Pleydell of Dorset already referred to is reported to have sent four roe to Windsor at the request of George IV. These were set free in the royal park but they evidently did not thrive there. Windsor Park has little holding cover as compared with Petworth and it is probable that these roe died off, as presumably did the Epping roe, whereas the Sussex deer have survived, thanks mainly to a more favourable natural habitat.

I wrote to Mr. E. H. Savill, Deputy Ranger at the Crown Estate Office at Windsor to ask him if he could tell me if there were any roe left in the environs of Windsor. He replied as follows:

> 'There were a few roe deer left in Windsor Park up to about ten years ago

but they have now all disappeared. There are, however, still quite a number of roe on this Estate near Bagshot.'

This letter is dated September 11th, 1948.

As has already been stated, roe deer appear to have survived well in Scotland and perhaps also in some of the far northern English counties, but the artificial transfers of roe which largely took place in the nineteenth century and which have not been repeated in the present century, have undoubtedly been the nuclei of the present-day spread of this deer throughout many parts of England. For example, roe from the original Dorset re-introduction have spread north, east and west into the counties of Somerset, Wiltshire, Hampshire, and even further afield. Descendants of the Petworth roe have found their way into Hampshire, Sussex and Surrey. There are to-day roe in Norfolk and probably Suffolk. Some of these deer are believed to be gradually migrating westwards into Cambridgeshire. The ancestors of these roe were possibly the Epping importation from Dorset.

Although I have not been successful in obtaining authentic reports from Wales, I believe that they are still to be found in some of the Welsh counties.

Roe nowadays are almost numerous in the counties of Durham, Northumberland and Cumberland. Re-afforestation of large tracts of land, both by the Forestry Commission and by private landowners, affords magnificent sanctuary for roe, once the young plantations have grown beyond the roe's power of causing damage to them. Vast forests like Kielder, Wark, Thrunton and Harwood in the county of Northumberland are typical of the newly-grown English forests capable of sheltering a big head of these woodland-loving deer.

Although normally roe prefer to live their lives in one locality, they will, at certain times of year and under certain circumstances, travel great distances. This wanderlust may be caused by a buck's or doe's desire to find a mate. In other cases several roe may be forced out of a district through constant disturbance and persecution. A deterioration of the feeding available in certain areas may cause deer to seek better conditions. Multiply this ceaseless migration over a number of years and, provided always that some form of suitable terrain is available, the result will be a gradual distribution into new places in these islands, where roe have not been seen in recent times.

Something very like this has taken place in Northumberland and Durham. Twenty years ago a roe was a comparative rarity in these counties. To-day they flourish. In certain parts of Northumberland any little patch of woodland may have its pair or party of roe.

Abel Chapman, in his last book, *Retrospect*, gives an illustration of a roe doe in his Houxty sanctuary, as if it were a most unusual creature to be seen there. This summer, during an early morning's stroll through the woods above the town of Rothbury on Coquetside, I counted eight roe, which means that there must have been a number of others in the locality which I did not see.

There are a number of other reasons why to-day we find roe on the increase and likely to spread to districts where he is at present unknown. There are fewer keepers to-day than there were before the 1914-18 war. With taxation as it is, landowners cannot afford to pay large numbers of keepers. I am afraid that the keeper, as a rule, is not a friend of the roe. He will kill him, unless specifically requested not to do so. This, I think, is largely due to the old prejudice against him as a potential destroyer of trees and a consumer of crops. This is again a case of giving a dog a bad name. Once this has been done, it takes a long time and much persuasion before the victim regains his good name.

Hunting people do not like roe, as hounds are inclined to run riot on them, therefore in many districts where hunting took place, the death sentence went out against any roe found. To-day the hunts are not in the same powerful position they used to occupy and very few masters can issue the edict of death against these deer throughout their districts with any real hope of seeing their orders carried out.

The lessened keeper population and the diminished power of hunting establishments has resulted in a measure of reprieve for the roe deer, but these factors are as nothing compared with the enormous areas of forest which have been planted during the present era for the protection of these deer. I think we can say that conditions to-day are more favourable than ever before for the increase and greater distribution of these delightful animals throughout Britain.

FIELD NOTES

An Early Redwing.—Whilst driving by Belvoir Castle, North Leicestershire, on August 29th, 1952, we came across a bird lying in the road. On stopping to investigate it was found to be a Redwing which appeared to have been hit by a passing vehicle, its left side being somewhat damaged. It permitted us to pick it up and revive it with some water, and although it was dazed and did not attempt to fly off, it was capable of preening itself. Eventually we left it in a safe position in a nearby hedge. This appears to be a very early date for the Redwing. The usual date of arrival is the end of September or the beginning of October, although the *Handbook of British Birds* gives a number of early dates for the autumn arrival, but only six are before August 29th.—L. M. Hill and F. J. Taylor.

Westerly Spread of Grasshoppers in the Huddersfield Area.—In recent years one of the most noticeable changes in the insect fauna of the Colne Valley (which lies to the west of Huddersfield) has been the appearance of large numbers of grasshoppers in places from which they were previously quite unknown. The species in question is the common *Chortippus bicolor* (Charp.). Ten years ago grasshoppers were either completely absent or excessively rare in this area, for at that time I well remember the pleasure occasioned by the stridulation of these creatures—a sound I never heard at home—on my visits to the Harrogate area.

This spread has also been noticed by Messrs. W. E. L. Wattam and E. W. Aubrook. The former tells me that grasshoppers appeared in the Newsome area a few years ago and that, so far as he is aware, they were unknown at the western side of Huddersfield during the sixty years prior to this date, and that formerly, to collect grasshoppers of any kind, local entomologists had to go some miles east of Huddersfield.

It would be interesting to hear if such a spread (or any phenomenal increase in numbers) has been experienced in other areas, or of any factors which can be correlated with such phenomena.

Mr. W. D. Hincks kindly confirmed my determination of the insect concerned, and tells me that *C. bicolor* is very common ' all over Yorkshire,' but that little is known of its detailed distribution or local movements.—G. Fryer.

CORRESPONDENCE

The Editor,
' The Naturalist.'

Sir,

Many naturalists are probably unaware of the conditions governing access to Swillington Park and Ings, so for their benefit, we append them herewith:—

(*a*) All parties or individuals to be in charge of the Chief Warden or one of his Assistant Wardens.

(*b*) The number of persons to accompany the Warden, or Assistant Wardens, shall not exceed four.

(*c*) During the shooting season, no visit may take place on Saturday afternoons without special permission in writing.

These conditions were not the idea of the Leeds and District Bird Watchers' Club, nor of the Yorkshire Naturalists' Union, but were imposed by an official of the National Coal Board, which body owns this area of land.

In accordance with these rules, and by virtue of an agreement with the Y.N.U., the Leeds and District Bird Watchers' Club have appointed a Chief Warden and four Assistant Wardens, one of whom will always be pleased to endeavour to accompany anyone wishing to visit Swillington. In addition, we have prepared one-day permit cards, without which no one should visit the area.

We appeal to everyone to observe the above conditions, as failure to do so might well entail a complete withdrawal of all facilities.

Therefore anyone desirous of visiting the area should first contact the Chief Warden, Mr. W. Bennett, Parker's Commercial Hotel, New Briggate, Leeds 1 (Telephone 24228), who will make the necessary arrangements.

Signed:

Eric Grace, *President.*
K. Dawson, *Hon. Secretary.*
Leeds and District Bird Watchers' Club.

THE YORKSHIRE NATURALISTS' UNION: NINETY-FIRST ANNUAL REPORT

The Ninetieth Annual Meeting was held in Leeds on December 1st, 1951, by kind invitation of the Leeds Naturalists' Club and Scientific Society and of the Leeds Co-operative Field Naturalists' Club. We were fortunate in having the Parkinson Building of the University available for this meeting.

The Presidential Address was given by H. Whitehead, B.Sc., on 'The Natural History of some Yorkshire Rivers.' This is printed in *The Naturalist*, 1952, pp. 1-6.

The Presidency for 1953 has been offered to and accepted by E. W. Mason, M.A., M.Sc., F.L.S., Commonwealth Mycological Institute, Kew, Surrey.

The Excursions for 1953:

V.C. 61. North Cave, July 11th.
V.C. 62. Ryedale, June 27th.
V.C. 63. Cawthorn, July 25th.
V.C. 64. Collingham, June 13th.
V.C. 65. Reeth, May 23rd-25th.

New Members.

Adams, F. W., 141 Sandygate Road, Sheffield 10.
Bird, G., Mount Pleasant Farm, Hatfield, E. Yorks.
Broadhead, G. J. R., Hollingdale, Bradfield, Sheffield 6.
Firth, E. S., 49 West Park Crescent, Roundhay, Leeds 8.
Greensmith, L. A., 24 Woodland Drive, Anlaby, E. Yorks.
Hemingway, G. E. C., 27 Marshfield Avenue, Goole.
Hewett, P. W., 61 Chester Drive, North Harrow, Middlesex.
Hillas, Col. K. N., The Beeches, Willerby, E. Yorks.
Hodgkinson, C., Fair Winds, Highbridge Lane, Scisett, Huddersfield.
Hoyle, A. C., 9 Tinker Road, Rawmarsh, Rotherham.
Jackson, W., B.Sc., Faddel Rigg, Kirbymoorside, Yorks.
King, C. E., 10 Rawcliffe Grove, Hull.
Longfield, Miss C., F.R.E.S., M.B.O.U., F.Z.S., 11 Iverna Gardens, Kensington, W.8.
Lund, J. W., Ellerker House, Everingham, York.
Mellor, Miss J., 43 Blakelow Road, Macclesfield.
Potter, C. H., Howecroft, Baldersby, Thirsk.
Quick, A. H., B.Sc., A.R.I.C., Greengarth, Quarryside Road, Mirfield.
Robinson, H. A., 97 Heworth Village, York.
Stephenson, K. M., East End Farm, Patrington, E. Yorks.
Stokes, W. R., 12 Lascelles Lane, Northallerton, Yorks.
Taylor, Miss M. M., College House, Wesley College, Leeds 6.
Taylor, M. K., Lark Rise, Shaftesbury Avenue, Hornsea.
Wallis, A. J., 13 Raincliffe Avenue, Scarborough.
Wrightson, B., 14 Oakcliffe Road, Smallbridge, Rochdale.

Family Members.

Hillas, D. K. N., The Beeches, Willerby, E. Yorks.
Hoyle, Mrs. A. C., 9 Tinker Road, Rawmarsh, Rotherham.
Wilson, Miss A. B., Ridgemont, Hartley Avenue, Leeds 6.

The Leeds Geological Association has resigned from the Societies affiliated with the Union.

FRESHWATER BIOLOGY

(E. Thompson).—Mr. Cheetham sends the following report from Austwick: The 1952 weather has been something like that of 1951, having a very dry spring period. The stream at Austwick was very low from early May to late June and this with persistent winds restricted insects, most noticeably in the Mayflies. The *Baetis* genus suffered least and has been reasonably plentiful throughout the year, their larvae being streamlined, moveable and holding to the bed of the stream give them an advantage in times of very low water. Mr. Crompton saw plenty of *Heptagenia lateralis* (Curt.) at the foot of Norber Syke on June 18th. It was taken there in 1922 but does not seem to have been noted in the interim. It was seen only

on one day and probably has a short flying period. The large Mayfly, *Ephemera danica* Müll., usually appears in quantity for a short time, but this year it was less plentiful though odd specimens were seen for much longer, being noted from May 20th to late August. *Ecdyonurus* was much less evident on the stream though noted plentifully in other localities.

Stoneflies appeared to suffer less from the low water condition, the Yellow Sally and *Perla* spp. were plentiful in May. A male *Perlodes mortoni* Klap. was taken on May 26th. The fisherman's Early Brown (*Protonemura meyeri* Pict.) was never in numbers as in 1950, but odd specimens were swept up on February 27th and onwards.

Amongst the Caddisflies the most evident species throughout the season were the Silver Sedge (*Odontocerum*) and the Welshman's Button (*Sericostoma*). The smaller genera *Psychomyia, Tinodes, Silo* and *Agapetus* were quite up to normal. *Drusus* and *Colpotaulius* were added to the stream list at the edge of Austwick Moss and on the Fen Beck several interesting species were taken. These two streams were deepened some feet by drainage operations a few years ago and the insect larvae are now on the lower levels. Perhaps the most interesting on the Moss stream are *Rhyacophila septentrionalis* MacL., *Limnephilus lunatus* Curt. and *Agapetus fuscipes*. On the Fen Beck *Mystacides azurea* L., *Goera pilosa* Fab., *Leptocerus bilineatus* L. and *Silo pallipes* Fab., whilst *Sericostoma* and *Odontocerum* are on both. On vegetation on the Moss single specimens of *Limnophilus elegans* Curt., *L. luridus* Curt. and *L. sparsus* Curt. were caught. On the Fen Beck in May the Alderfly was plentiful.

From Dewsbury, E.T. has the following to report. Searching our streams this year has been well rewarded. Days suitable for collecting have been many, waterside insects have been numerous and in some species they have swarmed far better than the last three seasons.

The first insect to appear at Coxley in any number was *Baetis rhodani* (Pict.) which was out by April 12th. As the year advanced its numbers diminished but again seemed to rise in late August. The imagoes of *Ephemera danica* Müll. have been a joy to watch and when sweeping streamside vegetation dozens have been disturbed. The first was seen on April 28th. Along Howroyd Beck a swarm of *Ecdyonurus venosus* (Fabr.) was in evidence on June 3rd, whilst nymphs of the same species were abundant. Later, from the same waters came *Leptophlebia marginata* (L.) on June 10th.

Plecoptera seem scarce in our area, but this year three species have been captured at Coxley—*Isoperla grammatica* (Poda) on May 30th, *Chloroperla torrentium* (Pict.) on June 3rd and *Nemoura cambrica* Steph. appeared in huge numbers on the same date.

Some species of Trichoptera have done well. Batley Park Lake and Greenhill Dam have been good collecting grounds. Around the lake at Batley numerous specimens of *Athripsodes* (*Leptocerus*) *aterrimus* Steph. were about on August 17th. From Greenhill Dam came *Molanna angustata* (Curt.) on July 5th. The lakes at Bretton have provided many large specimens of *Phryganea striata* L., a very handsome insect. On May 15th these insects were flying over the lakes in numbers and could be swept from every bush, and exuviae could be obtained in many places. From Bretton a female of *Glyphotaelius pellucidus* (Retz.) was also taken. The one captured was very well marked. Many insects of the same species were at rest in an old stone summer house. Only one Caddisfly was numerous at Coxley, this was the tiny *Agapetus fuscipes* Curt. on July 19th. Larvae have thrived in most places and those of *Hydropsyche*, one of the net builders, were numerous in the Coxley stream. In the same stream larvae of *Rhyacophila*, though rarer were evenly distributed. Larvae of the caddis *Molanna angustata* were common in Batley Park Lake. The case made by this caddis is most unusual, consisting of a flat piece of material in the shape of a blunt-headed spear, to which is added the pouch. Near the boathouse at Batley the shore of the lake is shallow with much gravel and the cases here have been easy to gather. So well do they blend with the gravel that local children, who collect anything that crawls or swims, have missed them. Larval cases of various species have been numerous in Whitley Lily Ponds; ponds on Emroyd Common and a pond between Coxley and Bretton promise well for next season.

For some of the above information your Convener is indebted to Mr. Laurie Ramsey, one of our associate members and to Mr. D. E. Kimmins, of the British Museum, for naming the more critical insects.

MAMMALS, REPTILES, AMPHIBIANS AND FISHES

Mammalia (Mrs. A. Hazelwood).—CHEIROPTERA: Valid records of the bats are still too few. With the exception of the Noctule, and sometimes the Long-eared Bat, sight records of any species on the wing are of limited value and can seldom be accepted even generically. It is necessary to seek out breeding quarters and hibernacula and to examine the creatures in the hand before a critical identification can be given and the enterprise is commended to the attention of bird-watchers in the ' off-season.'

INSECTIVORA: Hedgehogs continue to be reported mainly as road casualties, but Mr. Bramhill saw one make a precipitous descent as a bouncing ball in a successful attempt, he thinks, to evade a hunting badger.

The large mole colony at Roche Abbey is reported by Mr. Bramhill as being less than a quarter of the size it was last year; perhaps the normal ' crash ' after a cyclic abundance. The same observer saw many fights among Common Shrews in May, in one case involving seven combatants, but no fatal casualties resulted. Water shrews are reported from Roche Abbey (R.B.) and from Coxley by Mr. E. Thompson.

CARNIVORA: Judging from reports which deal mainly with their deaths, either by accident or by human design, the three larger carnivores continue to hold their own in the county except that the Fox is in some areas giving way to the determined attempts by farmers and poultry keepers to reduce its numbers. The newly-formed Holmfirth Fox Club has killed 125 foxes in 18 months. Badgers seem to be still on the increase, though Mr. Bramhill reports that they have suffered by hunters after ' badger grease ' and by irresponsible gassing, the latter eliminating a colony which he had watched with regularity and which had come to accept his presence with equanimity.

Mr. H. F. Woods saw four foxes on the Wolds on February 22nd, one of them nearly black.

A Stoat at Spurn was climbing the Heligoland trap (G.H.A.), and a Weasel at Hooton Roberts on September 20th was carrying a Blue Tit (R.B.), a somewhat unusual prey.

RODENTIA: Red Squirrels seem at last to be spreading from their strongholds, being generally reported as on the increase and extending their range. Grey Squirrels make slow progress and Mr. Baldwin comments on the fact that twenty successive examples shot at Methley were all males.

Hares and rabbits seem now to have recovered from their serious war-time setback and are in normal numbers in most localities.

It has not been a Vole year and nothing noteworthy is recorded among the small rodents.

Amphibia.—The most interesting report comes from Mr. Cheetham, who reports that on visiting a pond on a hill-side up Crummackdale at 875 ft. in search of frog-spawn on April 23rd, he found instead that the pond was black with tadpoles and devoid of all vegetation. This seems clear evidence of a neotony unusual in the frog. The tadpoles had no visible legs and their stomach contents when examined by Mr. Whitehead were found to contain ' debris and a number of recognisable desmids like *Comarium* and *Closterium*.' Some brought into an outdoor tank lived until August when the developed legs and were mostly eaten by birds. Those left in the pond failed to complete their metamorphosis and perished as their pond dried up in May.

Mr. Wattam records spawning at Newsome from February 25th to March 4th, and subsequently saw young frogs in very great abundance in many places around Huddersfield and Slaithwaite.

Reptiles.—The current increase in the number of reptiles sold into captivity makes it difficult to separate indigenous records from escapes, especially with Grass Snakes. This species is reported from Slaithwaite by Mr. G. Fryer who also records a personal observation of Common Lizards on Wessenden Moors. They are also recorded from the South Cliff Gardens in Scarborough.

A. fragilis var. *colchica*. Reported from Cloughton, near Scarborough, (1) in May 1951, (2) June 1952, by E. Gilmour.

Pisces.—The only report of interest is of the great increase in the numbers of Grayling in the River Ure, in the middle and upper reaches of which Mr. R. Procter believes it to be now the commonest fish.

This is a somewhat meagre report, but it is very gratifying to be able to say that the number of observers is obviously increasing. I have deliberately refrained from mentioning precise localities in the case of the Badger and of the Otter, since they are not yet free from persecution. More records are needed of the smaller mammals, of the deer which are now feral in many places and of the fishes such as Bleak, Burbot, Loaches and other species which are noteworthy to the naturalist if spurned by the angler.

In conclusion, may I add my thanks to all those naturalists who have co-operated to make this report possible.

ORNITHOLOGY

Interim Report (Ralph Chislett): The Annual Report for 1951 was duly published in *The Naturalist* and reprints made available.

At our March meeting the most popular item was a beautifully illustrated talk by G. K. Yeates, entitled 'Two Summers in Iceland.' The slides of Icelandic birds included a long set of the Great Northern Diver.

The Ornithological Conference organised by the British Ornithologists Union and the British Trust for Ornithology at Bamburgh from June 26th to July 2nd proved very enjoyable to several of our members, despite the fact that the Secretary of this Division had been invited to supply the programme for one evening, his subject being 'The Ornithological Year in Yorkshire.'

The Y.N.U. and several members were represented at the Exhibition of Bird Books organised in London in the spring by the National Book League.

Members should have received notices offering subscription terms for the book entitled *Yorkshire Birds*, which is now in the press and should be published before the year end.

There has been quite a crop of records of rarities during the year. Details of several, two White-billed Northern Divers and a Lesser Grey Shrike, have already appeared in *The Naturalist*. Additionally, the Little Ringed Plover, the Montagu's Harrier, the Quail, and the Garganey have bred. The Hoopoe, the Yellow-browed Warbler, and the Leach's Fork-tailed Petrel have occurred both at Spurn and inland, a Sabine's Gull near Scarborough, and a Great Shearwater at Spurn.

The Spurn Bird Observatory is having a successful year. Well over 2,000 birds have been ringed to date, covering the record number of 66 species. Rarities ringed include a Corncrake, a Hoopoe, a Great Spotted Woodpecker, and a Reed-Warbler, all of which were new to the traps. Two Barred Warblers, a Yellow-browed Warbler, a Woodchat Shrike, and a Great Grey Shrike have also been ringed. Mr. Ainsworth derives equal satisfaction from a number of interesting recoveries abroad of commoner species ringed in previous years.

Members are requested to send in their records for 1952 immediately after the year end, so that the detailed report may be printed for circulation before the March meeting. As Mr. Garnett will be out of England for the early months of 1953, notes from the North-east, if not sent to him before Christmas, should be sent direct to the Editor of the Report.

CONCHOLOGY

(Mrs. E. M. Morehouse): The outstanding records for the year have been received from E. Arnold Wallis, of Scarborough. These are:

Hygromia hispida var. *sinistrum* Monst. Holbeck Gardens, 1/8/52.
Hellicella virgata var. *sinistrum* Monst. Mount Side, Filey Road, 1/9/52.
H. virgata var. *nigrescens* Grateloupe. Roadside, Woodlands Cemetery, 12/9/52.

Mr. Wallis says *H. virgata* da Costa, *H. caperata* Montagu, *H. rufescens* Pen. are now very common on the new road. *Theba cantiana* Montagu has reached well into the district north of Scarborough. It has also become common between Cayton village and Seamer station where it was unknown a few years ago.

Testacella haliotidea Drap. Three specimens taken this year in Scarborough.

Vivipara contecta Millet still flourishes in a pond at Cayton Bay.

E. Robinson, Halifax, reports finding *Paludestrina Jenkinsi* Smith in the upper lake at Gibson Mill, Hardcastle Craggs. This is a new habitat for this mollusc. J. C. Lumb verified it and was there at the time of taking it.

Planorbis corneus L. is a record from Birstall Dam by Eric Thompson. He also took huge specimens of *Anadonta cygnea* L. from Bretton Park.

With Mr. Wallis, Mr. A. Smith found a small colony of *Zirfaea crispata* L., also *Barne candida* L. in the North Bay, Scarborough, 17/9/52. These were taken by the writer many years ago, but she has failed to find living ones lately, so these records are of especial interest.

We visited Scarborough on June 21st. It was a wet day and a good bag was the result: 14 land molluscs and two slugs were found, Miss Morehouse taking *H. nemoralis* var. *citrinozonata* Cockerell, a rare variety, on Castle Hill.

Caecilioides acicula Müll. was not seen in its old habitat, but S. G. Appleyard found it at Cridling Stubbs, a new locality. On July 19th the Yorkshire Conchological Society found it both at Little Smeaton and Stapleton Cottages.

Vivipara contecta Millet was taken by Miss Morehouse in a pond almost within the Doncaster town boundary. This is a new station. Along with this mollusc were several other species.

Milax budapestensis Hazay=*M. gracilis* Lendig found by S. G. Appleyard in the scullery sink of his house.

ENTOMOLOGY

Lepidoptera (E. Dearing): This report is prepared from notes submitted by W. Beck, J. Briggs, The Bradford Naturalists' Society, C. A. Cheetham, J. H. Flint, E. F. Gilmour, C. R. Haxby, F. Hewson, D. M. Jesper, P. Tannett, W. E. L. Wattam, and G. B. Walsh.

The weather during the season has proved in the main uncongenial, a frosty winter was followed by a cold windy spring and a very short period of what might be considered summer-time.

Mr. Walsh mentions that although the spring immigration of butterflies was well up to average in May the subsequent broods have fallen well below what might have been expected. On July 31st, Mr. Wattam ' spent the day at Gunthwaite and Ingbirchworth and encountered what must have been a good part of a migration of *Pieris brassicae*. This at the top end of the old coach road leading from the Penistone Road. The butterflies were in countless numbers on the road ruts and wayside vegetation feasting on moisture. When disturbed specimens covered parts of my body. I kept observation for upwards of an hour. It was noticeable that most specimens appeared to lack the usual lustrous colour, and there was a great variation in size. Throughout the period gradual dispersion was taking place, cloudlets of from two to four dispersing, always with the light breeze from the North-west.'

A typical specimen of the Peppered moth (*Biston betularia* L.) was taken as a pupa at Hampsthwaite by W. Beck, whilst the melanic form (ab. *carbonaria*) was attracted by Mercury vapour light at Knaresborough and taken by D. M. Jesper. Mercury vapour lights have been in operation at Knaresborough and Bradford and have produced some interesting results.

The following are the more interesting records:

Panemeria tenebrata Scop. (64). A good colony by river at Goldsborough; W.B.
Celaena leucostigma Hueb. (64). Askham Bog, 23/8; C.R.H. & J.B.
Diarsia rubi Vieweg (64). Askham Bog, 23/8; C.R.H. & L.B.
Panolis griseovariegata Goeze (64). Weeton; P.T. Knaresborough; W.B.
Plusia festucae L. (64). At M.V. Lights two at Knaresborough; W.B. Four in July at L. Horton; J.B.
Dasychira pudibunda (L.) (64). Ova, Bishop's Wood; W.B.
Eupithecia subfulvata (Haw.) (63). Gaisby, Shipley, 25/6; F.H.
Ecliptopera silaceata Schiff. (63). Gaisby, Shipley, 25/6; F.H.
Biston strataria (Hufn.) (64). At M.V. Lights, Knaresborough; W.B.
Ellopia prosaparia L. (64). Timble, 19/7; J.B.
Plagodis dolabraria (L.) (64). In fair numbers at M.V. Lights, Knaresborough; W.B.
Acherontia atropos L. (61). Weaverthorpe, 6/9; per E.F.G.
Celerio lineata var. *livornica* Esp. (65). Mewith, Bentham, 19/3; C.A.C. (64) Knaresborough at M.V. Lights, 8/10; W.B. (62) Aug., newly emerged, Holbeck, Scarborough; per E.F.G.
Herse convolvuli L. (62). Aug., 1951 and 1952, Scarborough; E.F.G. Scarborough, 14/9; G.B.W.
Euchloe cardamines (L.) (63). More numbers than usual in Bradford District.
Strymon w-album (Knoch) (64). Near Fountains Abbey on Blackberry flowers; D.M.J.
Gonepteryx rhamni L. (64). A few at Bishop's Wood, 14/4; C.R.H.

Pyrgus malvae (L.) (63). Brocodale Woods, Wentbridge; D.M.J.
Zeuzera pyrina L. (64). At M.V. Lights, Knaresborough; W.B. and L. Horton, 9/7; J.B.

At a Mercury-vapour Light-trap operated at Little Horton, Bradford, (63) J. Briggs has taken the following amongst others:

Citria lutea Stroem., 17/9 & 23/9; *Cucullia chamomillae* L.,* 16/5 & 19/5; *C. umbratica* L., 9/6 & 16/7; *Hada nana* Hufn., 12/6 & 24/7; *Hadena conspersa* Sch., 3/7; *H. lepida* (Esper), 7/5, 9/6 & 13/6; *Eupithecia succenturiata* (L.), 23/7; *Cidaria fulvata* (Forster), 23/7; and *Tethea duplaris* L., 24/7 & 25/7.

* Marks a new record for the Bradford district.

Mr. Briggs writes as follows:

The chief feature of my observations of Lepidoptera this year has been the checking up each morning of the contents of the M.V. Light-trap which I operate in my back garden. I put the light on first on April 21st, approximately 15 yards from a row of houses on the West, 30 yards on the North and 20 yards on the East. The South side, open only for a distance of 100 yards, overlooks allotments. In fact the situation is anything but ideal.

Light was switched on from dusk to dawn on 140 nights up to October 20th, the exceptions being in stormy weather and a holiday period. Each morning the catch was carefully recorded and interesting specimens kept for further examination. The greater number were released alive at various distances too far away to be likely to return, at least in any great numbers. (A few species which I consider as pests in the garden were given to the poultry.)

On April 25th I took the whole catch of 33 Hebrew Character (*Orthosia gothica*) males and after slightly clipping the forewing of each, released them three-quarters of a mile away in a direct line to the south. None returned until three days later, when two were found inside the trap. No others were seen.

Altogether 11,902 were counted and identified, whilst a further 100 were either too damaged or escaped while being handled. These were only Macro-Lepidoptera, no micros were counted, nor were the countless Diptera and other orders.

130 different species were taken, including the Chamomile Shark, a new local species. I later found that this species was breeding in the district.

By far the most common moth was the Dark Arches (*Xylophasia monoglypha*) with 2,669 and in great variation, first appearing on May 24th and continuing until September 23rd, the peak period being the six nights July 21st to 26th, when 1,409 were taken, over half the total. The Large Yellow Underwing (*Triphaena pronuba*) was the next most common species with 1,998, again in great variety.

The highest number of moths for one night was 855 on the night of July 24th-25th, 449 of them being *monoglypha*, and the most different species was 48, on the same date.

In October ground and air frosts greatly reduced the numbers as compared with 1951, in fact on several occasions no moths came in, although the trap had been lit the night through.

Coleoptera (Geo. B. Walsh).—The general consensus of opinion is that the season has been one of the worst on record, beetles being very scarce in numbers of both individuals and species. Two important papers on the Coleoptera of the Spurn Peninsula have been published in *The Naturalist* during the year, and these have added a number of species to both county and vice-county lists. The present report contains 21 new county species (†) and one deletion and 58 new vice-county species (*). The initials of the recorders are as follows:—

E.G.B.—E. G. Bayford	C.W.R.—C. W. Russell
H.H.C.—H. H. Corbett	H.M.R.—H. M. Russell
J.H.F.—J. H. Flint	W.J.S.—W. J. Sanders
E.F.G.—E. F. Gilmour	S.S.—S. Shaw
J.H.—J. Horsman	W.O.S.—W. O. Steel
W.D.H.—W. D. Hincks	M.L.T.—M. L. Thompson
T.B.K.—T. B. Kitchen	G.B.W.—G. B. Walsh
A.R.—A. Robertson	A.E.W.—A. E. Winter

Nebria gyllenhali (Schoen.) var. *rufescens* (Stroem, H.) †(62) High Langdale, 11/9/51; A.R. There has been no previous record of this variety, though it doubtless occurs on some of the mountains of West Yorks.
Clivina fossor Herbst (64) Scotton; A.E.W.
Dyschirius aeneus Deg. *(61) Spurn; S.S.

Bembidion obliquum Sturm (62) Sand Hutton, near York, 20/7/52; A.S. det. E.F.G.
B. fumigatum (Dufts.) †(61) Spurn, on several occasions; S.S.
B. assimile Gyll. (61) Spurn, on several occasions. The only other Yorkshire records are (61) Hornsea, 1859; W.K.B. and (62) Saltburn, 1877; M.L.T.
B. quadrimaculatum (L.) (62) Peat cutting near 'Falcon Inn,' Cloughton, –/9/52; E.F.G.
B. articulatum (Panz.) †(61) Spurn, 6/51; J.H.F. (64) Barlow, 8/5/52; J.H.F.
B. iricolor Bed. †(61) Spurn and Saltings on several occasions; S.S.
B. gilvipes Sturm (64) Scotton Banks; A.E.W.
Harpalus attenuatus Steph. †(61) Spurn, 7/6/50, 2 spns.; S.S.
Stenolophus mixtus (Herbst) *(61) Spurn, several spns. at grass roots, 6/6/50; S.S.
Harpalus angusticollis Muell., G. *(61) Welwick, 15/7/48; S.S.
Previously recorded only from Fenay Beck (V.C. 63).
Amara eurynota (Panz.) (63) Newmillerdam, near Wakefield, 11/11/51; J.H.
Synuchus nivalis (Panz.) (64) Scotton Banks, 24/6/44; A.E.W.
Haliplus immaculatus Gerh. Spurn, 14/6/47; W.D.H.
H. confinis Steph. (61) 1♀. Spurn, 14/6/47; W.D.H. A rare Yorkshire beetle.
Hygrobia hermanni (Fabr.) Spurn; W.D.H. The statement in *The Naturalist* (1952, p. 132) that this species is known in Yorkshire only from a few East Riding localities is in error. It was taken by E. B. Wigglesworth at (63) Heath Common and Doncaster (1879) and by G.B.W. at (62) Throxenby Mere, near Scarborough in 1939 (Yorks. Col. Comm. Report, 1939). Also taken in numbers at Sand Hutton (62) 6/52; A.S.
Hydroporus tristis (Payk.) (64) In moorland streams at 1,100 ft., Ilkley Moor, 16/4/52; J.H.F.
Dytiscus dimidiatus Bergstr. (64) Hob Moor brickponds, York; J.H. Gilson's Bog, Askham Bog; J. J. Chisholm, det. J.H.
Acilius canaliculatus (Nic.) (63) Rawcliffe Moor, in peaty pools, 1♂. 2♀♀., 18/8/52; J.H.
Gyrinus caspius Men. (61) Spurn; J.H.F. (*The Naturalist*, 1952, p. 133). The only other Yorkshire records are Coatham (M.L.T.) and Hull (C.W.R.).
Helophorus minutus Fabr. *(61) Spurn; W.D.H.
Sphaeridium scarabaeoides (L.) *(61) Spurn; W.D.H.
Cercyon pygmaeus (Ill.) *(61) Spurn; W.D.H.
Laccobius sinuatus Motsch. †(61) Spurn; T.B.K.
Choleva angustata Fabr. *(61) Spurn; W.D.H.
Catops nigricans (Sp.) *(61) Spurn; W.D.H.
C. fuliginosus Ev. *(61) Spurn; J. Spittle.
C. coracinus Kell. *(61) Spurn; J. Spittle.
Leiodes furva (Er.) †(61) Spurn; A.E.W.
Agathidium laevigatum Er. *(61) Spurn; W.D.H.
Orthoperus brunnipes (Gyll.) *(61) Spurn; W.D.H.
Stenichnus exilis (Er.) (64) Scarcroft, near Leeds, 3/2/52; J.H.F.
Corylophus sublaevipennis du Val. †(61) Spurn, 4/6/50; W.D.H.
Ptenidium fuscicorne Er. *(61) Spurn; W.D.H.
Siagonium quadricorne Kirby, W. (64) Tadcaster district, commonly under elder and elm bark, 6/4/52; J.H.F. and H.M.R.
Micropeplus porcatus (Fabr.) *(61) Spurn, uncommon; W.D.H.
Omalium caesum Grass. *(61) Spurn; W.O.S.
Philorinum sordidum (Steph.) *(64) On *Ulex europaeus*, Shadwell, near Leeds; W.J.S.
Lesteva. A paper on this genus by W. O. Steel appeared in the *Ent. mon. Mag.*, 88, 1952: 44.
L. fontinalis Kies. †(64) Widespread in the Horton-in-Ribblesdale and Settle areas; W.O.S.
L. heeri Fauv. *(61) Spurn, in reed debris; W.O.S. (64) Horton-in-Ribblesdale, 7/52; W.O.S.
L. luctuosa Fauv. (64) Removed from the British list by W. O. Steel (l.c.). The Malham spns. are *L. pubescens* Mann. (fide W.O.S.).
Eudectus giraudi Redt. (64) A single spn. on the summit of Penyghent, 7/52; J.H.F. A single spn. had previously been taken by E. W. Morse at the base of Ingleborough (V.C. 64), crawling on a rock, 7/13 (*The Naturalist*, 1913, p. 401).
Carpelimus foveolatus (Sahlb.) †(61) Spurn, very common; W.O.S.
C. pusillus Grav. *(61) Spurn and Kilnsea saltings; W.O.S.
Bledius defensus Fauv. *(64) In a limited area of the Ribble bank near Horton-in-Ribblesdale, 7/52; W.O.S.

Bledius opacus (Block) (61) Base of cliffs, Filey, 6/52; J.H.F. This has not been recorded for many years—Teesmouth (G. T. Rudd), Bridlington Quay (W. W. Fowler).
B. occidentalis Bondr. †(61) In the banks of a pond in the *Phragmites* area of Kilnsea Warren; W.O.S.
Stenus crassus Steph. †(61) Spurn, 9/6/50, 2 spns.; W.O.S.
Astenus longelytratus Palm. *(61) Spurn, not uncommon; W.O.S.
A. pulchellus (Heer) †(61) Spurn, not common; W.O.S.
Lathrobium fulvipenne (Grav.) var. *letzneri* Gerh. †(61) Spurn; W.O.S.
Achenium depressum (Grav.) †(61) Kilnsea saltings, 7/6/50; W.D.H.
A. humile Nic. †(61) Spurn, on sea-cliff, 17/6/50; W.O.S.
Erichsonius cinerascens (Grav.) (63) Haworth Moor, 24/6/44; W.D.H.
Philonthus tenuicornis Muls. & Rey. *(61) Spurn, 6/50, a few spns. in straw refuse; W.O.S.
P. marginatus Fabr. (64) Penyghent, 1,350 ft.; J.H.F.
Gabrius appendiculatus Sharp *(64) Catrigg Foss, Stainforth, 13/9/42; W.O.S.
Staphylinus compressus Marsh. (62) Thornton-le-Dale; W.D.H.
Ontholestes tessellatus (Geoffr.) (63) Deffer Woods, Cawthorne, 19/9/42; J.H.F.
Quedius lateralis (Grav.) (62) Thornton-le-Dale; W.D.H.
Lordithon exoletus (Er.) (63) Cawthorne Park Woods, 20/9/48; J.H.F.
Tachinus elongatus Gyll. *(64) Ling Ghyll, 30/7/42; W.D.H.
Aleochara (*Ceranota*) *ruficornis* Grav. (64) By sweeping *Mercurialis perennis*, Milne Woods, 26/5/51; W.J.S.
Atheta cavifrons Sharp (64) Bransghyll, Horton-in-Ribblesdale, 14/6/43; J.H.E.
Bryaxis macropalpus (Aubé) (64) Towton Woods, 2/3/52; J.H.F. and H.M.R.
B. puncticollis Denny *(61) Skipwith Common, 13/6/47, in moss; W.D.H.
Hister duodecimstriatus Schr. †(61) Spurn, in cow dung, 4/6/50; J.H.F.
Dictyopterus affinis (Payk.) *(62) Raincliffe Wood, 7/51; A.R. In *The Naturalist*, 1903, p. 407, H. H. Corbett recorded this beetle from Wheatley Wood, 7/03, in the same spot where Mr. E. G. Bayford had taken the larvae some years before. There are no other Yorkshire records.
Podabrus alpinus (Payk.) (64) Scotton Banks, 17/6/45; A.E.W.
Cantharis darwiniana (Sharp) *(61) Common at Welwick; W.D.H. There is only one (doubtful) Yorkshire record of this species from Eston-in-Cleveland (62); M.L.T.
C. fulvicollis Fabr. (64) Lime-hills, Leeds, 19/5/51; W.J.S.
C. paludosa Fall. *(61) Spurn; W.D.H.
Malthodes pumilus (Breb.) (62) Near Hawnby, 14/6/49; W.D.H. Hutton-le-Hole, 14/6/49; W.D.H.
M. dispar (Germ.) (64) Scotton Banks, 9/6/45; A.E.W.
Opilo mollis (L.) †(62) Under spruce bark in Raincliffe Wood; A.R. (conft. G.B.W.).
Anthrenus fuscus Ol. *(64) Wood Hall near Leeds, 14/7/44; W.D.H.
Syncalypta setigera (Ill.) (61) Spurn, 19/7/48, at grass roots; 6/50, under stones; W.D.H. The only earlier Yorkshire record is Flixton, (61); G.B.W.
Laria dulcamarae Scop. (61) Spurn; W.D.H. Rare as a Yorkshire insect.
Meligethes erythropus (Gyll.) *(61) Spurn on *Potentilla reptans* L., and *Lotus corniculatus* L.; W.J.S. Previously recorded only from Saltburn; M.L.T.
Epuraea melanocephala (Marsh.) (61) Driffield on *Prunus spinosa*, 12/5/51; W.J.S.
Dacne bipustulata (Thunb.) *(64) Scotton, in fungi under bark of felled apple-tree, 14/10/45; A.E.W.
Henoticus serratus Gyll. (64) Wike, Leeds, in profusion in *Polyporus squamosus* and in a ground agaric, 7/8/44; W.D.H.
Cryptophagus hirtulus Kr. †(61) Spurn, in straw refuse, 9/6/50; J. Spittle.
C. umbratus Er. (64) Leeds, in carrion trap, 7/4/51; W.J.S.
C. badius Sturm *(61) Spurn, 6/6/50; J.S. (64) Leeds, in carrion trap, 23/5/51; W.J.S.
C. acutangulus Gyll. (64) Leeds, in carrion trap, 7/11/50; W.J.S.
C. punctipennis Bris. (64) Leeds, in carrion trap, 12/5/51; W.J.S.
C. ruficornis Steph. *(64) Leeds, in carrion trap, 7/11/50; W.J.S. The only previous Yorkshire record is Allerthorpe Common.
Atomaria atra (Herbst) *(61) Spurn, on damp log, 22/7/48; J. Spittle. The only previous Yorkshire record is Skelder, V.C. 62; H. Britten, jr.
A. ruficornis (Marsh) *(64) Leeds, grapefruit trap, 22/5/51; W.J.S.
A. linearis Steph. *(61) Spurn; W.D.H.
A. affinis Sahlb. (62) Near Hawnby, 14/6/49; W.D.H.

Olibrus liquidus Er. (61) Spurn, 16/6/51; W.D.H. This confirms the only other Yorkshire record (61) Pocklington; W.D.H.
Stilbus testaceus (Panz.) *(61) Spurn, 20/6/51; W.D.H. The only previous record is Doncaster district, 1907; H.H.C.
Enicmus histrio Joy *(64) Leeds, in carrion trap, 25/5/51; W.J.S.
Corticaria umbilicata (Beck) *(64) Austwick Moss, 27/9/49; W.D.H.
Corticarina fuscula (Gyll.) (64) East Keswick, near Leeds, 15/4/51; W.J.S.
Melanophthalma transversalis (Gyll.) †(61) Spurn, 18/7/48; W.D.H.
Pseudotriphyllus suturalis (Fabr.) (61) Holme-on-Spalding Moor, 6/9/49; W.D.H. Skipwith, 7/9/49; W.D.H.
Scymnus frontalis (Fabr.) *(61) Spurn, 10/7/48; W.D.H. The only other Yorkshire record is Osmotherley (62); M.L.T.
Cis bidentatus (Ol.) *(61) Skipwith Common, 7/9/49; W.D.H.
Hedobia imperialis Latr. (64) Thorner, 25/5/52; J.H.F.
Xestobium rufovillosum Deg. (64) Six spns. on hardwood denuded of bark, Scotton, 1943; A.E.W.
Rabocerus gabrieli Gerh. *(64) St. Ives, Bingley, 8/9/45; W.D.H.
Hallomenus binotatus (Quens.) (64) Leeds, 1946; D. Applegarth.
Anaspis rufilabris Gyll. (64) Bramham Woods, near Leeds, 14/5/51; W.J.S.
Tetratoma ancora Fabr. (61) Brayton, Selby, in *Collybia radicata*; T.B.K. and W.D.H.
Melandrya caraboides (64) Scotton Banks, 27/6/44; A.E.W.
Aphodius subterraneus (L.) *(61) Spurn; W.D.H.
A. aestivalis Steph. *(61) Spurn; J. Spittle.
A. sordidus (Fabr.) *(61) Spurn; W.D.H. Recorded from Redcar; M.L.T.
A. plagiatus (L.) †(61) Kilnsea Saltings, common; W.D.H.
Trox sabulosus (L.) (64) Leeds; D. Applegarth.
Dorcus parallelopipedus (L.) (64) Selby, 10/7/50; A.S.
Pogonocherus hispidus (L.) Allerthorpe Common, 2 spns., 1/9/49; W.D.H.
Saperda carcharias (L.) *(62) Lowdales, near Hackness, 10/7/51; A.R. This restores the beetle to V.C. 62; the record in Fowler's *Brit. Col.*, W. 252 is an error.
Macroplea appendiculata (Panz.) (64) A new colony in R. Wharfe *above* Harewood Bridge, about ¾ mile from 1951 record; J.H.
Donacia clavipes Fabr. *(64) Cocoons, all containing mature beetles, abundant on *Phragmites* at Hob Moor brickponds, York, 4/9/52; J.H.
D. sparganii Ahr. *(64) One in flower of *Nuphar lutea*, Birkin, 28/7/52; J.H.
D. marginata Hoppe (61) One specimen in cocoon on *Sparganium ramosum*, 27/8/52; J.H.
D. vulgaris Zsch. (61) Abundant near Wheel Hall, Riccal. (64) Hob Moor brickponds, York, 28/9/52; J.H.
D. cinerea Herbst *(63) Cocoons containing beetles abundant on *Typha*, Balne Ponds, 28/9/52; J.H.
Plateumaris affinis Kunze *(64) Cocoons containing beetles abundant on *Carex* sp., Old Eye, Birkin, 2/9/52; J.H.
Cryptocephalus labiatus (L.) (64) Scotton Banks, 9/6/45; A.E.W.
Phyllotreta atra (Fabr.) *(61) Spurn; W.D.H.
Aphthona euphorbiae (Schrank) *(63) St. Ives, Bingley, 8/9/45; W.D.H. *(64) By sweeping *Mercurialis perennis*, Stutton, 12/5/51; W.J.S. The record for V.C. 64 in Ste. Man. refers to *venustula*.
A. nigriceps (Redt.) (61) Barlow, 7/9/49; (64) Austwick, 25/9/49; W.D.H.
A. venustula Kutsch. *(61) Spurn; W.D.H. There are very few Yorkshire records.
Longitarsus ochroleucus (Marsh.) *(61) Spurn; W.D.H.
L. succineus (Foudr.) *(61) Spurn; W.D.H.
L. parvulus (Payk.) *(61) Spurn; W.D.H. Recorded only from Doncaster; E.G.B.
Psylliodes picina (Marsh) (62) Near Hawnby, 14/6/49; W.D.H.
P. napi (Fabr.) (62) Near Hawnby, 14/6/49; W.D.H.
Sphaeroderma testaceum Fabr. (62) Peat cutting near ' Falcon Inn,' Cloughton, 9/52; E.F.G.
Bruchus rufimanus Boh. *(61) Welwick; W.D.H.
Apion radiolus Kirby, W. (62) Staithes, 1/6/52; W.J.S.
A. pallipes Kirby, W. (64) On *Mercurialis perennis*, Kippax, 29/4/52; W.J.S.
A. seniculus Kirby, W. Very local in Yorkshire (64) Linton Common, 24/5/52; W.J.S.
A. marchicum Herbst (61) On *Rumex acetosella*; Spurn,; J.H.F.

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Apion pisi Fabr. (64) Linton Common, 24/5/52; W.J.S.
A. hookeri Kirby, W. *(61) Spurn; W.D.H.
A. vorax Herbst (64) Scarcroft, near Leeds, in grass tufts, 3/2/52; J.H.F.
Sitona humeralis Steph. (61) Leeds, 12/5/51; W.J.S.
Anthonomus pomorum (L.) (62) Near Hawnby, 14/6/49; W.D.H.
Magdalis carbonaria (L.) (64) Grass Woods, 21/5/45; W.D.H.
M. ruficornis (L.) (64) Askham Bog, 25/4/44; W.D.H.
Ceuthorhynchus pyrrhorhynchus Marsh. †(64) Boroughbridge, 14/7/45; W.D.H.
C. viduatus (Gyll.) †(61) Spurn, 16/8/49; T.B.K.
Orobitis cyaneus (L.) (64) Ringhay Wood, Hook Moor, in grass tufts, 23/11/51; J.H.
Gronops lunatus (Fabr.) †(61) Spurn; W.D.H.
Hylastes cunicularius Er. *(64) Near Bramham, 12/5/51; W.J.S.
Pityogenes bidentatus (Herbst) (64) Scotton Banks, 15/4/45; A.E.W.
Dryocoetes autographus (Ratz.) (62) Cloughton, 7/51; A.R.
Strophosomus subrotundatus (Marsh.) var. *asperifoliarum* Steph. †(61) Allerthorpe Common on conifers; W.D.H.

Diptera (K. G. Payne): A visit paid to Allerthorpe Common on April 14th showed Diptera to be quite plentiful. Females of several species of Chironomidae were egg-laying and an *Hydrellia* species (Ephydridae) was also common on the surface of the extensive areas of water. The pretty mottled winged Dolichopod, *Hydrophorus nebulosus* Fln. was plentiful, as recorded by Dr. Fordham and Mr. Cheetham in 1920. It was only seen on ground at the edge of the water where the reddish young shoots of regenerating heather were the main vegetation, together with a little *Juncus squarrosus* L. and plentiful *Webera nutans* Hedw., pale green with the young capsules. The *Hydrophorus* could not be found on the water surface in spite of twenty minutes' search.

On May 11th, *Hilara* species of the *maura* group were common at Askham Bog and the ubiquitous Empid, *Ocydromia glabricula* Fln., whose season extends till late in October, was to be found, together with a *Platypalpus*. By the next week a number of Empid species were plentiful, particularly *Empis pennaria* Fln. and *E. trigramma* Mg., the latter being seen sucking hawthorn flowers.

Examination of the webs of the little green spider *Aranea cucurbitina* spun across the concavities of blackcurrant leaves in the garden, showed them to contain the remains of such large predatory flies as *Rhamphomyia sulcata* agg. and *Empis livida* L., each many times larger than the spiders, as well as of *E. chioptera* Mg. and of *Platypalpus* species.

The remarkable and very distinctive *Rhamphomyia* (*Pararhamphomyia*) *geniculata* Mg. was taken on May 17th round the edges of peaty pools on Strensall Common and probably was in some numbers. Previously it had been recorded only from Austwick Moss in 1927. *R. laevipes* Fln. and *Hilara interstincta* Fln. were there too.

While one got the impression of a rather restricted dipterous fauna at the Loftus Whitsun meeting of the Union, some very interesting species were collected. Special attention was paid to the flies of the fast-flowing streams and one good spot was at Scaling Mill on Roxby Beck, where the stream flows in a deep wooded course below the fall. *Tipula cheethami* Edwards was taken on the spray-drenched vertical rock face by the fall, where the prettily-marked *Dicranomyia didyma* Mg. was common, as also was *Clinocera nigra* Mg., one of the Empids frequently associated with such places and far less uncommon than the previous records suggest. This is the first record for V.C. 62 of *Tipula cheethami*, the species first found by Mr. Cheetham on the Penyghent ghylls, and whose pupae are to be found projecting from wet moss about falls. A female *Dicranomyia didyma* was found just emerging from a pupa projecting from gelatinous reddish material on the rock face by the fall, which Miss Mattinson kindly examined and found to be mainly vegetable detritus. *Rhamphomyia dentipes* Zett., a remarkable Empid unmistakable in its distorted and toothed rear legs and male hypopygium, was taken here on Roxby Beck and on Hagg Beck. A rather similar community of flies was present about the spray-damped surface of a weir on Grinkle Beck. Females of a *Paradicranota* (species not yet determined) were hovering about wet moss, and apparently ovipositing in it, and the beautiful *Liancalus virens* Scop. and the Empids *Wiedemannia rhynchops* Now. and *Hydrodromia stagnalis* Hal. were perching on the vertical surface. Other flies found about the Loftus stream included the Tipulids: *Tipula vernalis* Mg., *T. variipennis* Mg., *Dolichopeza albipes* Strom., *Limnophila submarmorata* Verrall,

Limonia macrostigma Schummel, *Rhipidia maculata* Mg., and *Erioptera* (*Ilisia*) *maculata* Mg.; and the Dolichopods *Porphyrops crassipes* Mg. and *Xiphandrium appendiculatum* Zett. A rather surprising feature of the Loftus becks was their paucity in *Hilara* species, only three species being taken in three days' collecting as compared with seven species taken in two hours' collecting at Boston Spa the previous week-end. A *Sciara* (Mycetophilidae) species, present in countless millions on the sea cliffs at Hummersea and also common on *Enteromorpha*-covered rocks on the shore at Staithes was *S. carbonaria* Mg., a widely-distributed species.

A male *Rhamphomyia tarsata* Mg., one of the interesting species belonging to *Pararhamphomyia* and having the anal vein faint in the middle, was swept (when taking *Hilara* species) over the water at Boston Spa on May 25th.

Two males of the rather rare *Tipula nigra* L. (*teste*, C.A.C.) were taken at Askham Bog on June 29th, a very hot oppressive day. Previous records suggest that in Yorkshire this is a fly of the lowland marshes.

During the week-end of the Litton meeting of the Union, observation of flies was rather limited by bad weather. *Tipula cheethami* Edw. was flying in light rain at about 1,600 ft. O.D. on Penyghent on June 14th, and heavier rain in the morning appeared to affect not at all the activity of the Empid *Wiedemannia rhynchops* Now. This was plentiful on Crooke Ghyll above 1,550 ft., flying very close to the surfaces of pools so as to look like an *Hilara*, and extending up to 1,950 ft. O.D. where the water flows over abundant hepatic-covered rocks. It also was common on a little mossy rill at 1,600 ft. on the west side of the fell. *Chelifera praecatoria* Fln., one of the species with enlarged predatory forelegs, was taken with it here. *Clinocera nigra* Mg. was collected on Crystal Beck on the way up to Birks Tarn on June 15th. This is a fine stretch of water, and in view of its completely exposed position, between 1,950 and 2,000 ft. O.D., overlooking Buckden in Wharfedale, its fly fauna is of some interest. A pair of the water-surface Dolichopod *Hydrophorus praecox* Lehm. were taken and not less than six more seen, looking very white on the water in the sun. The same species was the only *Hydrophorus* which could be found at the very similar Fountains Fell Tarn last July. *H. nebulosus* Fln. was on exposed peat at the edge of the tarn, and presumably as much at home as near sea-level at Allerthorpe in the Central Plain, as Mr. Cheetham has taken it frequently on the high ground. The Ephydrid *Stictoscatella quadrata* Fln. and the bird parasite *Ornithomyia lagopodis* Sharp were among the few other species to be swept about Birks Tarn on this breezy day. *O. lagopodis* occurs mainly on birds which frequent the moors, and particularly on the Red Grouse. A number of specimens of *Dolichopus rupestris* Hal., together with several Anthomyid species were taken by sweeping the typical moor top vegetation of heather, bilberry, mat-grass and *Eriophorum vaginatum* L. This Dolichopod appears to be a true upland species, and was recorded by Verrall as not uncommon on mountain sides in the Lake District and at Braemar.

The Union meeting at Leckby Carr on June 28th was of most interest from the point of view of the Dolichopods. *Hercostomus* (*Gymnoternus*) *aerosus* Fln. was present in tremendous numbers about the drains and patches of stagnant water in the carr. *H.* (*Gymnoternus*) *cupreus* Fln. was swept with the last species. Males and females of *H. nigripennis* Fln. were taken feeding in flowers of *Potentilla erecta* (L.) Räusch. This nectar sucking is of special interest as the proboscis is as long as the head is high in this species, a very unusual lengthening among British Dolichopodidae, in which nectar-feeding appears to be rare. A female of the Empid, *Phyllodromia melanocephala* Fab. was swept in the carr. The very common *Dolichopus ungulatus* Lw. was present in quite exceptional numbers, flitting very actively over the surface of standing water near Aram Grange and landing on the water and on the cattle-trodden mud round the edges. The numbers were such that 70 were taken in a few strokes of the net. A female *Hydrophorus* taken on this water matched exactly females of *H. albiceps* Frey (taken elsewhere together with the readily determined males). This also was one of the places where the showy *Dolichopus brevipennis* Mg. was taken during the year.

By August, Empid species are not numerous, but among the late summer species is *Empis* (*Coptophlebia*) *vitripennis* Mg., swept round shallow peaty pools at Skipwith on August 25th. The only previous Yorkshire record is that of Mr. Cheetham who took it a few miles away, at Allerthorpe Common, on August 15th, 1925, so it is only known, so far, from V.C. 61.

Ocydromia glabricula Fln., one of the commonest of Empids throughout the summer, was still to be swept at Boston Spa on October 5th, and a male of one of

the less common Tipulae, the autumn woodland species *signata* Staeger, was taken. On the whole, autumn species seem to have been scarce this year. *Tipula pagana* Mg., usually plentiful round the house and garden in Copmanthorpe in October, has not been seen, and neither has the large October species, *T. czizeki* de Jong.

New County and Vice-County records are not included here. It is hoped to produce a separate list of them shortly.

Hemiptera (J. H. Flint): In spite of the generally poor weather during the latter half of the summer, collecting has been more widespread than for some time past, and as a result there are two new County records and several Vice-County records. A box of aquatic species passed to me for checking by J. Horsman contained some interesting material, including a single male *Cymatia bonsdorffi* Sahl. taken at Barnbow, Leeds (V.C. 64), on November 17th, 1951, this species not having been recorded previously in the county. The Spurn expedition in July, while disappointing in the general paucity of Hemiptera, provided another County record: a single *Nabis lineatus* Dahl., taken on Kilnsea Saltings, and passed over at the time of collecting as the common *N. limbatus* Dahl., which had been noted as occurring commonly.

I am indebted to Messrs. W. D. Hincks, J. Horsman, and H. M. Russell for specimens and records, the more notable of which are listed below, and indicated by their captors' initials. The writer is responsible for all determinations except where initials are enclosed in brackets.

HETEROPTERA

Picromerus bidens L. (62). Pilmoor, 30/8/52; J.H.
Aradus depressus F. (*64). Thorner, 15/5/52; J.H.F.
Dictyonota tricornis Schr. (*61). Kilnsea, 7/52; W.D.H.
Pantilius tunicatus F. (*64). Askham Bog, 19/10/52; J.H.
Deraeocoris ruber L. (*64). Leeds, 8/52; H.M.R.
Hydrometra stagnorum L. (63). Balne Ponds, near Snaith, 28/9/52; J.H.
Gerris argentatus Schum. (*63). Balne Ponds, commonly, 28/9/52; J.H.
Chartoscirta cincta H.-S. (64). Scarcroft, near Leeds, 3/2/52; J.H.F.
Notonecta obliqua Gall. (*63). Rawcliffe Moors, 18/8/52; a dark form with only the front half of the pronotum and a narrow band on the clavus pale. (64) Wigton, near Leeds, 3/8/52; commonly, with examples of var. *delcourti* Poiss.; J.H.
Corixa wollastoni D. and S. (64). Ilkley Moor, at 1,100 ft., 16/4/52; J.H.F.
C. venusta D. and S. (*64). Lindley Moor, 14/4/52; J.H.F.
C. fossarum Leach (*63). Balne Ponds, 28/9/52; (64) Hob Moor brickponds, near York, 11/9/52; J.H.
C. falleni Fieb. (*63). Stapleton Park, Wentbridge, 8/52; J.H.
C. distincta Fieb. (*63). Balne Ponds, 28/9/52; J.H.
C. panzeri Fieb. (64). Barnbow, near Leeds, 21/9/52; J.H.

HOMOPTERA

Araeopus pulchellus Curt. (*61). Spurn, 7/52, not uncommonly along the main ridge and sand dunes; J.H.F.
Newsteadia floccosa De G. (62). Cloughton, 9/52; (W.D.H.).

Odonata (J. H. Flint): The year has been disappointing. Dry conditions in the first half resulted in a severe lowering of the water level in some habitats, as was the case in Walker Butts Bank Dyke at Kilnsea, where dragonflies were in consequence almost absent. In places where the water level remained unaffected, the dull cool weather of the latter half of the summer, when one normally looks for dragonflies on the wing, made collecting unrewarding.

One notable species was taken by the writer at Kilnsea, a mature male *Sympetrum fonscolombii* Selys, a rare immigrant not recorded previously so far north in England. Careful but unsuccessful search for other specimens revealed that besides *S. striolatum* Charp., *S. sanguineum* Müll. was also breeding in Long Bank Dyke, probably the first time that the latter species has been noticed breeding within the county, though it is known as a migrant.

Lestes sponsa Hans. and *L. dryas* Kirby, though absent from their previously recorded station at Kilnsea, were found in numbers in another dyke, a possible indication that *dryas* may be more widely spread in this part of the county. The writer's experience in Essex indicates that *dryas* occurs in the same type of habitat as *sponsa*, frequently the two being found flying together, and examination of known colonies of *sponsa* may reveal *dryas* also. The species are readily separable on

examination in the field, so it is not necessary to decimate colonies of *sponsa* to make such a check, and entomologists should avoid taking more specimens of *dryas* than are necessary to establish the validity of a record, as this dragonfly is generally rare and is on the edge of its range in Yorkshire.

Trichoptera (H. Whitehead): As in former years Mr. Cheetham has been busy collecting caddisflies in Austwick and a more detailed account of his observations are given in the report of the Freshwater Biological Committee. He is to be congratulated on having added another species (*Limnophilus elegans* Curt.) to the extensive Yorkshire list. His observations carried out year after year in the same district are throwing light on the seasonal occurrences of the winged stages and, at the same time, yielding valuable information on the number of broods per annum for each species. Very little is known about the breeding habits of Trichoptera in Britain.

About a year ago Mr. Hincks handed to me the card catalogue of Yorkshire Trichoptera made by the late J. M. Brown. Most of the entries had already been published in *The Naturalist* and elsewhere, but it has given your recorder the opportunity of checking the records in his possession.

It is of interest to reflect that caddisflies have been collected and species recorded in the county for more than 72 years. May I for a few moments take stock a little ? One of the earliest contributors was G. T. Porritt whose collection of over 3,000 specimens is in the Tolson Museum, Huddersfield. J. M. Brown and Fordham also collected extensively and in our county list the initials of our friend John Wood frequently appear. Our county list now has 123 species or about 65 per cent. of the British fauna. So far we may congratulate ourselves on the results of over 70 years' collecting and recording.

A question arises which often troubles me and it is this: Are we obtaining facts which will give us a picture of the distribution of species within the county ? The lists in my possession show that V.C. 64 has yielded the greatest number of species, viz. 104. Then, in descending order, we have V.C. 62, 85 species; V.C. 63, 73 species; and V.Cs. 61 and 65 each with 42 species. It might be argued that fewer species of caddis occur in V.Cs. 61 and 65. A rough analysis of the numbers of *records* in each V.C. shows that out of 1,400 records we get about 40 per cent. from V.C. 64, 25 per cent. from V.C. 62, 20 per cent. from V.C. 63, 10 per cent. from V.C. 61 and from V.C. 65 less than 5 per cent. From this analysis I draw two conclusions: (1) that our haphazard system of collecting does not throw light on distribution within the county, and (2) that as far as Trichoptera are concerned (and probably other groups), V.C. 65 awaits exploration.

Orthopteroid and Neuropteroid Orders (W. D. Hincks): There is very little to report this year in regard to the several Orthopteroid and Neuropteroid orders for which I am recorder. Due to the excellent work of the late J. M. Brown most of our Yorkshire species are fully recorded and additional records are likely to be very few.

In the Orthoptera movements of the populations of *Roeseliana roeselii* (Hagenb.) and *Conocephalus dorsalis* (Latr.) at Spurn were noted in July. The former appeared for the first time within the area set aside for study when nymphs were discovered in Walker Butts Bank Dyke. A colony of *C. dorsalis* was discovered in the lane leading to the Kilnsea saltings. It is probable that these two species which appear to reach their northern limits near the Humber will be found to be established all along the estuary.

The aphid-feeding Neuroptera have been fairly plentiful during the season but though a number of records have been added no new vice-comital ones have come to light. Similarly there is nothing new to report on the Psocoptera. In the Megaloptera larvae of a snake-fly, probably *Agulla xanthostigma* (Schum.) were plentiful at Skipwith in early September and were found to be hibernating in cavities in the fungus *Polyporus betulinus*, on birch.

Hymenoptera (W. D. Hincks): It seems to be generally agreed by Lepidopterists and Coleopterists that the past season has been a very poor one. This is not the case with the Hymenoptera however, which generally have been more than usually plentiful at least during the early part of the season. As early as Whitsuntide many Parasitica were on the wing whereas such is usually the case only much later in the season. At Spurn in July Parasitica were abundant in species and

individuals but were definitely less so than in the remarkable July of 1948. The present season has been a favourable one for aphids which were present in numbers early in the year and continued to increase during the summer. It was therefore not unexpected that aphid parasites proved to be plentiful especially in late summer. The cold weather in early September, however, brought the season to a rather abrupt termination. This was particularly noticeable in South-east Yorkshire in the early part of the month and later on the North-east coast.

During the year two new Fairy flies (Mymaridae) have been described from Yorkshire material by the recorder. These are referred to in the following list which includes the additions to the county for 1951 and 1952. The recorder particularly wishes to thank Mr. J. Wood for his invaluable help; it will be seen that a large proportion of the additions to our list have resulted from his collecting. Specimens have also been collected by other members as indicated in the list and, in addition, I would like to thank Messrs. G. B. Walsh, K. G. Payne and E. F. Gilmour for specimens and records. Thanks are also due to the referees who have so kindly checked or determined specimens which are recorded below. These are Messrs. H. Britten (H.B.), A. W. Stelfox (A.W.S.), J. F. Perkins (J.F.P.), G. J. Kerrich (G.J.K.), and S. Shaw (S.S.). The following list includes seven species new to Britain (‡) (five of them new to science), 51 new County (†) and 46 new Vice-County (*) records.

Additions to the Yorkshire Hymenoptera, 1951-2:

SYMPHYTA

**Arge fuscipes fuscipes* (Fall.) (63). Bingley, St. Ives, 1♂, 31/5/47; J.W.

**Tenthredo balteata* Klug (63). Hebden Bridge, 1♂, 29/7/45; W.D.H.

**Rhogogaster punctulatus* (Klug) (63). Keighley, Riverside, Utley, 1♀, 19/6/47; Bingley, St. Ives, 2♂, 2♀, 21/6/47. 18/7/47; J.W.

†**Macrophya albipuncta* (Fall.) (64). Grassington, 1930; J.W.; (65*) Upper Teesdale, 1939; R.B.B. (Benson, 1952, *Handb. ident. Br. Ins.*, **6** (2b): 130); (64) Malham, 1♀, 5/6/48; J.W.

†*Dolerus taeniatus* Zadd. Hitherto known only from salt-marshes in Devon, Essex and Suffolk. (61) Spurn, Warren, 10/6/50; Kilnsea Saltings, 20/6/51; W.D.H. About a dozen specimens of both sexes.

**D. triplicatus* (Klug) (61). Spurn, Warren, 4/6/50; Kilnsea Saltings, 7/6/50; W.D.H.

BRACONIDAE

‡*Bracon spurnensis* Hincks (1951, *Ent. mon. Mag.*, **87**, 232.) (61) Spurn, Walker Butts Bank Dyke, 22/7/48, 18/7/48; Kilnsea, Long Bank Dyke, 21/6/47, 1♂ 2♀♀ types; Kilnsea, lane leading to Saltings, 17-18/7/52, 1♀; W.D.H.

†*B. robertii* Wesm. (64). Shipley Glen, Rough Side, 1♀, 22/6/46; J.W.

**B. variator* Nees (63). Keighley, Old Cut River, 15♀♀, 15/9/45, 17/9/45; Keighley, Royd Lane, 1♀, 13/10/46; J.W.

**B. discoideus* Wesm. (61). Spurn, Warren, 1♀, 13/8/49; W.D.H. (A.W.S.).

†*Rogas geniculator* Nees (61). Spurn, near Salt Marsh, 1♀, 18/6/47; W.D.H. (A.W.S.).

†*Agathis tumidula* (Nees) (61). Spurn, Warren, 1♀, 20/7/48; W.D.H. (A.W.S.).

†*Meteorus rubens* Nees (61). Spurn, Warren, at light, 12/8/49; W.D.H. (A.W.S.).

†*Opius decoratus* Stelfox (1949, *Ent. mon. Mag.*, **85**, 307) (61). Spurn, Warren, 1♀, 21/7/48; W.D.H. (A.W.S.).

‡*Atopandrium loripenne* Graham (1952, *Ent. mon. Mag.*, **88**, 20) (61). Kilnsea, Long Bank Dyke, 16/8/49, ♂ type; W.D.H.

†*Phaenocarpa livida* Hal. (61). Spurn, Warren, 1♀, 21/7/48; W.D.H. (A.W.S.).

†*Aspilota concinna* (Hal.) (64). Leeds, Lime Hills, 1♀, 4/5/46; W.D.H. (A.W.S.).

†*A. fuscicornis* (Hal.) (65). Masham, 1♂, 11/10/47; W.D.H. (A.W.S.).

†*A. concolor* (Nees) (64). Bolton Percy, 1♀, 22/5/43; Leeds, Lime Hills, 1♀, 15/5/46 W.D.H. (A.W.S.).

†*Praon abjectum* Hal. (61). Spurn, Warren, 1♀, 14/8/49; W.D.H. (A.W.S.).

ICHNEUMONIDAE

†*Coelichneumon ruficauda* (Wesm.) (63). Keighley, Morton, 1♀, 31/7/42; J.W. (J.F.P.).

**Stenichneumon culpator* (Schrank) (62*). Thornton-le-Dale, 1♀, 25-29/4/46; (64*) near Sicklinghall, 1♂, 23/7/41; Selby, Brayton, 1♀, 22-23/6/43; W.D.H. (J.F.P.).

†*Aoplus* (*Stenichneumon*) *ochropus* (Gmel.) (63). Keighley, Holmehouse Wood, 1♂ 1♀, 28/7/42, 15/9/46; Bingley, St. Ives, 1♀, 18/7/47; J.W. (J.F.P.).

**Ctenichneumon castigator* (F.) (63). Bingley, St. Ives, 1♀, 13/7/46; J.W. (J.F.P.).

†*Amblyteles* (*Spilichneumon*) *fabricii* (Schrank) (63). Keighley, Newsholme Dene, 25/7/42; J.W. (J.F.P.).

†**Probolus culpatorius* (L.) (63). Keighley, Holmehouse Wood, 1♂, 13/9/36; Silsden, ♂♀ *in cop.* 14/9/49; J.W. (J.F.P.). (61*) Skipwith, 1♀, 13/9/41; W.D.H. (J.F.P.).

†*Phaeogenes* (*Proscus*) *suspicax* (Wesm.) (64). Askham Bog, 1♀, 7/9/46; W.D.H. (J.F.P.).

†**Anisoctenion* (*Acrotomus*) *triangulatorius* (Grav.) (64). Grassington, 19/5/45; (62*) Beedale, 9/6/45; W.D.H. (G.J.K.).

†*A.* (*A.*) *rubiginosus* (Grav.) (64). Grassington, 19/5/45; W.D.H. (G.J.K.).

†*Smicroplectrus perkinsorum* Kerrich (63). Keighley, 1♀ paratype, 15/6/35; J.W. (G.J.K.).

**Cteniscus auriffuus* Hal. (64). Askham Bog, 15/7/44; W.D.H. (G.J.K.).

†*Stenomacrus confinis* (Holmgr.) (63). Keighley, Holmehouse Wood, 2♀♀, 2/10/37, 11/10/41; J.W. (H.B.).

**Zootrephus suspiciosus* (Brischke) (63). Keighley, Marley, 1♀, 15/6/37, 1♂, 16/9/39; Riverside, Utley, 1♂, 26/8/39; J.W. (H.B.).

**Diplazon tricinctatorius* (Thunb.) (64). Leeds, Oakwood, 2♀♀, 4-7/6/38, 1♀, 13/8/39; Askham Bog, 1♀, 24/7/43; W.D.H. (H.B.).

**D. graculus* (Grav.) (63). Keighley, Marley, 1♀, 25/5/37; Riverside, Utley, 1♂, 29/6/39; Holmehouse Wood, 1♀, 21/10/39; J.W. (H.B.).

**D. annulatus* (Grav.) (63). Keighley, Old Cut River, 1♀, 17/8/39; J.W. (H.B.).

**D. varicoxa* (Thoms.) (63). Keighley, Marley, 1♀, 1/7/37; Holmehouse Wood, 1♀, 13/7/37, 1♀, 9/9/39; Riverside, Utley, 1♀, 31/5/39; J.W. (H.B.).

†**D. flavolineatus* (Grav.) (63). Keighley, Holmehouse Wood, 1♀, 29/8/39, 1♀, 24/10/39; J.W. (H.B.). (64*) Cowthorpe, 1♀, 3/8/42; W.D.H. (H.B.).

†*D. citropectoralis* (Schmd.) (63). Keighley, Park Wood, 1♀, 28/7/38; J.W. (H.B.).

†*D. fissorius* (Grav.) (63). Keighley, Holmehouse Wood, 1♂, 22/8/37; Bingley, St. Ives, 1♀, 1/6/46; J.W. (H.B.).

†**D. tricolor* (Stelfox) (63). Keighley, Holmehouse Wood, 1♀, 29/5/39; Ponden Wood, 29/6/40. (64*) Bolton Woods, 1♀, 3/6/39; J.W. (H.B.).

†*D. subopacus* (Stelfox) (63). Keighley, Marley, 2♀♀, 23/9/37, 1♀, 1/7/39; Woodhouse, 1♀, 3/8/39; Holmehouse Wood, 1♀, 8/6/40, 1♀, 6/7/40; J.W. (H.B.).

†**D. megaspis* (Thoms.) (63). Keighley, Marley, ♀♀, 10/7/37, 16/9/39; Holmehouse Wood, ♀♀, 19/8/39, 9/9/39; Tip River, ♀♀, 17/8/39; Morton, 1♀, 29/7/42; J.W. (H.B.). (64*) Leeds, Oakwood, 1♀, 4-7/6/38; W.D.H. (H.B.). Skell Valley, 1♀, 10/6/39; J.W. (H.B.).

†**D. longiventris* (Thoms.) (64). Bolton Woods, 1♂, 5/6/37. (63*) Keighley, Holmehouse Wood, ♂♀, 29/5/39, 6/6/40, 4/10/42; Ponden Wood, 1♂, 3/8/40; J.W. (H.B.).

†*D. gracilentus* (Holmgr.) (63). Keighley, 2♂♂, 14/6/41; J.W. (H.B.).

**D. nigritarsis* (Grav.) (64). Leeds, Oakwood, 1♂, 6/8/38; W.D.H. (H.B.).

**D. elegans* (Grav.) (63). Keighley, Marley, 1♀, 4/8/40; J.W. (H.B.).

†*D. pulcher* (Holmgr.) (63). Keighley, 1♀, 29/8/37; Marley, 1♀, 21/8/37, 1♂, 16/9/39, 1♀, 28/7/42; Holmehouse Wood, 1♀, 4/10/42; J.W. (H.B.).

†*D. pallipes* (Grav.) (63). Keighley, Marley, 1♀, 4/8/37, 1♀, 11/9/37, 1♀, 31/8/40; Ponden Wood, 1♀, 3/8/40, 1♀, 9/8/40; J.W. (H.B.).

†*Promethes scutellaris* (Bridgm.) (63). Keighley, Holmehouse Wood, 2/9/39, 23/9/39, 30/9/39, 14/10/39, 8/9/40; J.W. (H.B.).

**P. cognatus* (Holmgr.) (63). Keighley, Holmehouse Wood, 4/6/37, 15/8/37, 6/8/39, 15/9/40; Marley, 6/8/39, 12/8/39; J.W. (H.B.).

**P. monticola* (Voll.) (63). Keighley, Holmehouse Wood, 1♀, 12/8/39; Ponden Wood, 1♀, 30/8/40; J.W. (H.B.).

†**P. pulchellus* (Holmgr.) (64). Skell Valley, 1♀, 10/6/39; Leeds, Meanwood Woods, ♂♂, 29/7/39. (63*) Keighley, Holmehouse Wood, 1♀, 2/9/39; J.W. (H.B.).

**P. dorsalis* (Holmgr.) (63). Keighley, Marley, 1♀, 4/8/37, 1♂, 4/8/40; Holmehouse Wood, 1♂, 23/8/40; Ponden Wood, 1♀, 3/8/40; J.W. (H.B.). (64*) Leeds, Blackmoor, 1♀, 13/8/38; W.D.H. (H.B.).

**Ophion scutellaris* Thoms. (65). Kilburn, 1/8/34; M. D. Barnes (H.B.).
**O. minutus* Kriechb. (63). Honley, 1/6/35; M. D. Barnes (H.B.); Wentbridge, 5/6/37; M. D. Barnes (H.B.); Bingley, St. Ives, 10/6/50, 2/6/51; J.W. (H.B.).
†*O. slaviceki* Kriechb. (64). Near Harewood, 11/9/42; W.D.H. (H.B.).
†*O. impressus* (Thunb.) (63). Bingley, St. Ives, 2/6/44, 15/6/46; J.W. (H.B.).
†*O. parvulus* Kriechb. (63). Bingley, St. Ives, 29/5/43; J.W. (H.B.); 3/6/44; W.D.H. (H.B.).
**O. stigmaticus* Morley (63*). Bingley, St. Ives, 11/9/43, 9/10/43, 8/9/45; Keighley, Holmehouse Wood, 5/6/43; J.W. (H.B.). (64*) Bolton Percy, 23/5/43; W. G. Bramley (H.B.); Leeds, Lime Hills, 28/5/44; J.W. (H.B.).
†**Absyrtus vicinator* (Thunb.) (64). Aberford, 27/7/37; Bolton Woods, 27/9/41; Grass Woods, 19/5/45. (63*) Keighley, Holmehouse Wood, 23/8/37; Morton, 27/7/42, 31/7/42, 15/8/42; Newsholme Dene, 31/7/42; Colden Valley, 1/8/47; Bingley, St. Ives, 8/7/44, 1/8/44, 29/7/46, 26/6/48; J.W. (H.B.).
†*Parabates nigricarpus* Thoms. (63). Keighley, Holmehouse Wood, 7/10/34; Bingley, St. Ives, 2/6/45; J.W. (H.B.).
†**P. tarsatus* (Brischke) (64). Aberford, 21/6/41. (63*) Shipley Glen, 6/6/42; J.W. (H.B.). (61*) Spurn, Warren, 14/8/49; W.D.H. (H.B.).
**P. latungula* Thoms. (63). Keighley, Holmehouse Wood, 26/9/42; Elam Wood, 12/5/45, 4/5/46; J.W. (H.B.).
**P. cristatus* Thoms. (64). Aberford, 21/6/41; J.W. (H.B.); Leeds, Oakwood, 6/42; W.D.H. (H.B.); Ling Ghyll, Horton-in-Ribblesdale, 2/7/42; W.D.H. (H.B.); Shipley Glen, Rough Side, 15/6/43; J.W. (H.B.); Leeds, Lime Hills, 28/5/44; J.W. (H.B.).
†*Paniscus brachycerus* Thoms. (61). Spurn, 8/6/47; C. A. Cheetham (H.B.).
**P. testaceus* Grav. (62). Scarborough Mere, 13/6/43; W.D.H. (H.B.). (65*) Kilburn, 1/8/34; M. D. Barnes (H.B.).

Cynipidae

†*Callaspidia dufouri* Giraud (61). Allerthorpe Common, 1♀, 12/9/50; W.D.H. (S.S.).

Chalcidoidea

†*Brachymeria minuta* (L.) (61). Kilnsea Saltings, 2♀♀, 20/6/51; Spurn, Warren, 1♀, 23/6/51; Spurn, 7/52!; W.D.H. & S.S.
†*Eudecatoma mellea* (Curtis) (61). Land of Nod, 2♀♀, 3/9/51; W.D.H.
†*Aphycus punctipes* (Dalm.) (65). Hackfall! 26/9/48; W.D.H.
†**Microterys tessellatus* (Dalm.) (61). Allerthorpe Common, 12/9/50. (62*) Thornton le-Dale, 5-8/10/45; W.D.H. (65*) Masham, 4/48; W. A. Thwaites; Hackfall, 26/9/48; W.D.H.
†*M. sylvius* (Dalm.) (64). Near Huby, 1♀, 22/6/46; W.D.H. (G.J.K.).
†*Cheiloneurus elegans* (Dalm.) (61). Spurn, Warren, 1♀, 20/7/48; W.D.H. (G.J.K.).
**Callitula pyrrhogastra* (Walk.) (61). Spurn, Warren, 1♂, 20/8/49; W.D.H. (G.J.K.).
†*Homoporus gibbiscuta* Thoms. (61). Spurn, Warren, 1♀, 17/8/48; W.D.H. (G.J.K.).
†*Cirrospilus vittatus* Walk. (64). Near Rigton, 24/5/47; W.D.H.
†*Aphelinus flavus* (Nees) (61). Skipwith, 1♀, 7/8/44; W.D.H. (G.J.K.).

Mymaridae

†**Ooctonus insignis* Hal. (65). Hackfall Woods, 26/9/48, ♂♀ (neotypes in Dublin Museum, Haliday Collection), also 1♂ 2♀♀ same data; W.D.H. (63*) Keighley, Holmehouse Wood, 11/8/46, 26/7/49, 29/7/49; J.W.; Newsholme Dene, 1♀, 29/8/48; J.W. (Hincks, 1952, *Trans. Soc. Brit. Ent.*, **2**: 154).
‡*O. askhamensis* Hincks (*loc. cit.*, **2**: 156) (64). Askham Bog, 1♀, 7/9/46, type; W.D.H.
**O. vulgatus* Hal. (62*). Mulgrave Woods, 26/2/38, 1♀; H.B., jnr. (63*) Worsborough, 1♀, 21/5/49; W.D.H.; Keighley, Holmehouse Wood, 1♀, 18/10/47; J.W.; Bingley, Beckfoot, 1♀, 22/9/47; J.W. (65*) Masham, 1♀, 19/10/47; Hackfall Woods, 1♀, 26/9/48; W.D.H.
‡*Lymaenon fossarum* Hincks (1952, *J. Soc. Brit. Ent.*, **4**, 64) (61). Spurn, Walker Butts Bank Dyke, ♀ type, 17/8/49; W.D.H.

Proctotrupoidea

†*Helorus anomalipes* (Panz.) (64). Brayton, 1♀, 6/8/48; W.D.H.
†*Galesus clypeatus* Thoms. (61). Brantingham Dale, 1♀, 3/9/51; W.D.H.

ACULEATA

†*Anteon fulviventre* (Hal.) (65). Masham, 8/48; W. A. Thwaites.

Plant Galls (E. F. Gilmour): Firstly I would like to make a request that more members send me records from other parts of Yorkshire, or failing that, then the fresh specimens as they find them. Few records have been made from other than the region surrounding Scarborough for a few years now, and it is desirable that this be widened.

I would like to thank Mr. H. Rowntree for many specimens brought to me in the Scarborough District.

	Agent	*Plant*
COLEOPTERA	*Gymnetron* sp. (? *linariae* (Panz.)), Thornton-le-Dale, 12/7/52 (H.R.).	*Linaria vulgaris* Mill.
HYMENOPTERA	*Cynips divisa* Hartig, Forge Valley, nr. Scarborough, 21/5/52 (H.R.).	*Quercus robur* Linn.
	Rhodites rosae (Linn.), Mowthorpe Cut, Hackness, nr. Scarborough, 19/6/52 (H.R.). [A fully developed gall, *c.* 30 mm. diam.]	*Rosa canina* Linn.
	R. eglanteriae Hartig, Scalby Nabs, nr. Scarborough, 29/8/52 (E.F.G.)	*Rosa canina* Linn.
	Pontania pustulator Forsius, Lowdales, nr. Scarborough, 5/7/52 (H.R.); South Cliff, Scarborough, 9/7/52 (E.F.G.).	*Salix viminalis* Linn.
	Euura amerinae (*L.*) Folkton (Wolds), 25/7/52 (H.R.).	*S. pentandra* Linn.
DIPTERA	*Jaapiella veronicae* (Vallot), Scarborough Mere, —/6/52 (H.R.).	*Veronica chamaedrys* Linn.
	Wachtliella persicariae (Linn.), Scarborough, 25/6/52 (E.F.G.)	*Polygonum persicaria* Linn.
	W. persicariae (Linn.), Seamer Carrs, nr. Scarborough, 21/8/52 (H.R.).	*Polygonum amphibium* Linn.
	Dasyneura ulmariae (Bremi-Wolf), Thornton-le-Dale, 12/7/52 (H.R.); Banks of R. Derwent, nr. West Ayton, 17/7/52 (E.F.G.). [Very common.]	*Spiraea ulmaria* (Linn.)
	D. urticae (Perris), Banks of R. Derwent, nr. West Ayton, 17/7/52 (E.F.G.).	*Urtica dioica* Linn.
	Contarinia steinii (Karsch), Lowdales, nr. Scarborough, 5/7/52 (H.R.).	*Melandrium rubrum* (Weig).
HOMOPTERA	*Rhopalosiphum crataegellum* (Theobald), Thornton-le-Dale, 18/5/52 (H.R.).	*Crataegus monogyna* Jaeq.
	Semiaphis atriplicis (Linn.), Castle Hill, Scarborough, 3/7/52 (H.R.).	*Chenopodium album* Linn.
	Aphalara nebulosa (Zett.), Banks of R. Derwent, nr. West Ayton, 17/7/52 (E.F.G.).	*Chamaenerion angustifolium* (Linn.)
	Trichochermes walkeri (Forst.), Forge Valley, nr. Scarborough, 6/10/52 (H.R.)	*Rhamnus cathartica* Linn.
ACARI	*Eriophyes avellanae* Nalepa, Forge Valley, nr. Scarborough, 16/1/52 (E.F.G.).	*Corylus avellana* Linn.
	E. tiliae Pagenst., Middleton, nr. Pickering, 15/5/52 (H.R.).	*Tilia vulgaris* Hayne
	E. brevitarsus Focken., West Ayton, nr. Scarborough, 19/6/52 (E.F.G.).	*Alnus glutinosa* (Linn.) (*rotundifolia* (Mill.))
	E. origani Nalepa, Pexton Moor, Thornton-le-Dale, 29/6/52 (H.R.)	*Origanum vulgare* Linn.

ACARI—(*cont.*)	*E. similis* Nalepa, Woolton Carrs, nr. Thornton-le-Dale, 12/7/52 (H.R.)	*Prunus spinosa* Linn.
	E. thomasi Nalepa, Hutton-le-Hole, 13/7/52 (H.R.).	*Thymus serpyllum* Linn.
	E. laevis Nalepa, Banks of R. Derwent, nr. West Ayton, 17/7/52 (E.F.G.).	*Alnus glutinosa* (Linn.)
	E. galii Karp., Hilber Green, nr. Scarborough, 23/7/52 (H.R.).	*Galium aparine* Linn.
	E. pyri Pagenst., Forge Valley, nr. Scarborough, 14/8/52 (E.F.G.).	*Sorbus aucuparia* Ehrh.
FUNGI	*Taphrina aurea* Fries., South Cliff, Scarborough, 9/7/52 (E.F.G.).	*Populus tremula* Linn.
	Epichloe typhina Persoon. (Almost certainly). Woolton Carrs, nr. Thornton-le-Dale, 12/7/52 (H.R.).	*Hordeum* sp. (Barley).

BOTANY

(Chris. A. Cheetham).—1952 has been in many ways similar to 1951, starting with a mild winter then a dry, cold spring restricting plant growth until mid-June when rain produced a surprising growth of vegetation and gave an abundant hay crop. Many early spring flowers were delayed and reduced in quantity especially Primroses. Spring Whitlow grass seedlings were very abundant in November, but these were killed off by frost, very few flowering in March. The Mealy Primrose on Sulber made up in numbers for its absence in 1951. The plants suffered from lack of moisture and were stunted, but the Autumn Gentian, not seen last year, has produced plenty of normal plants. The Barren Strawberry usually flowering throughout winter was not seen until mid-March. A noticeable feature on Austwick Moss in May was the great show of Cotton-grass and with it an abundance of flower on the Cranberry. At a distance of a mile or two the area appeared like a lake owing to the white heads of the Cotton-grass. This was a result of the fire at Whitsun 1951 when the accumulated dead leaves of the Purple Moor grass (*Molinia*) and in a lesser degree those of the Cotton-grass were burnt off. The late flowering *Molinia*, though scorched, bloomed at its late flowering time, but the Cotton-grass was burnt at its early flowering time and did not regain growth nor did it flower in 1951, but this year it has made amends. The Wild Rose and May blossom in mid-May were very early and on the Moss the Andromeda has made a fine show on three occasions. Many plants made extraordinary growth, especially Bugle, Selfheal, Betony and Harebells, whilst the profuse flowering of Violets, Horseshoe Vetch, Rock Rose, Knotted Pearlwort, Eyebright and Heather still remains in memory. The Bluebells and Orchids were only poor.

Plant Records (W. A. Sledge): The Botany Section has been well represented at all Union Excursions, and perhaps the most notable record for the year was Miss Kilby's discovery of *Arenaria gothica* above Heseltine Gill, on the occasion of the Y.N.U. meeting at Litton. The new station is about five miles in a direct line from Selside and the type of ground on which the plant grows is virtually identical with that in its other known situations. The view has been expressed that the *Arenaria* is of recent origin here and enquiries by Mr. Cheetham have established the fact that on at least one occasion in recent years sheep have been loaded into a van in the Selside lane and transferred to the slopes of Fountains Fell. The possibility of seed transference in this way is undeniable though the plant might well have been there for a very long time and have been overlooked. Miss Mattinson's detection of *Ceterach* on Oxenber—a much more frequently-visited area—is a particularly striking instance of how species may be overlooked even on well-worked ground.

In the Report for 1949 (*The Naturalist*, 1950, 33) I recorded the failure of attempts made to prevent the clearance of carr-wood on the margin of Thorne Moor, where *Viola stagnina* flourished. On revisiting this area in July with Mr. G. A. Nelson, we found that a small area which included the part where the violet grows, had been left undisturbed and the plant continues to flourish there. We were unable to find any of the plants which we tried to preserve by removal to adjacent ground three years ago.

Records have been received from Miss C. M. Rob, Miss E. Crackles, F. W. Adams, F. Murgatroyd and A. Malins Smith. I have received several collections of fresh plants sent by Mr. W. Bunting from the Thorne and Hatfield areas and these included a number of interesting gatherings as detailed below. Mr. J. Horsman has contributed a list of plants observed by him and Mr. Chisholm which was received too late for inclusion in this report.

Equisetum variegatum Schleich (65). Bain Gill, Bainbridge; C. M. Rob.

Osmunda regalis L. (63). Still on Thorne Moor and about twenty plants seen on Hatfield Moor; W. Bunting.

Ceterach officinarum DC. (64). Oxenber, Austwick, several plants; K. Mattinson.

Polystichum setiferum (Forsk.) Woynar (63). Elland Park Wood, Halifax; F. Murgatroyd.

Ranunculus sardous Crantz (63). Plentiful in cornfield, East Cowick; W.A.S. and G. A. Nelson.

R. Lingua L. (63). Hatfield Moor, south side; W. Bunting.

Papaver Lecoquii Lam. (62). Rievaulx, a single plant near car park; C. M. Rob.

Fumaria Boraei Jord. (Det. N.Y. Sandwith) (63). Arable land, Dore Road, near Dore, Sheffield; F.W.A.

F. micrantha Lag. (Det. N.Y. Sandwith) (65). Leckby; C. M. Rob.

Conringia orientalis (L.) Dum. (62). Topcliffe Station sidings; C. M. Rob.

Lepidium perfoliatum L. (62). Topcliffe Station sidings; C. M. Rob.

Myagrum perfoliatum L. (62). Topcliffe Station sidings; C.M. Rob.

Cardamine latifolia Vahl. (62). See *Nat.*, 1950, 33. The finder was Miss Anita Nock, not H. Rowntree.

Descurainia Sophia (L.) Prantl. (63). Hatfield Moor, south borders; W. Bunting.

Viola stagnina Kit. (63). Still at Thorne Moor (*vide supra*); W.A.S.

Hypericum elatum Ait. (63). Naturalised on Hatfield Moor; W. Bunting det. W.A.S.

Agrostemma Githago L. (63). Cornfield, Whitley Thorpe; W.A.S. and G. A. Nelson.

Sagina nodosa (L.) Fenzl. (63). Crimsworth Dene, a few plants in boggy ground. First record for Halifax parish; F. Murgatroyd.

Arenaria gothica Fr. (64). Heseltine Gill; Ruth Kilby. See *supra* and *Nat.*, 1952, 179. A notable extension of range.

Amaranthus retroflexus L. (61). Garden weed, Sutton, nr. Hull; E. Crackles.

Althaea hirsuta L. (61). Bombed site, Hull; E. Crackles.

Linum anglicum (61). Plentiful on chalk wolds near Sherburn; J. Webster.

Geranium rotundifolium L. (63). See *Nat.*, 1949, 37. The plant is more widespread in these sand pits than was realised in 1948. *G. pusillum* Burm. f. is also there; W.A.S. and G. A. Nelson.

G. molle L. var. *aequale* Bab. (Conf. Brit. Mus.) (61). Bombed site, Hull; E. Crackles.

Melilotus indica (L.) All. (63). By rough track near Blackbrook Wood, Rivelin Valley; F. W. Adams.

Coronilla varia L. (61). Waste ground, Hull; E. Crackles.

Vicia tetrasperma (L.) Schreb. (63). Cornfields, Hatfield Moor; W.A.S. Beauchief Golf Course, Sheffield; F. W. Adams.

Filipendula vulgaris Moench (63). Stapleton Park, Wentbridge; J. Horsman.

Rosa villosa L. × *R. coriifolia* Fr. (Det. R. Melville) (64). Eldwick; A. M. Smith.

Circaea intermedia Ehrh. (63). Rivelin Valley, Sheffield; F. W. Adams. The record in Lees' *Flora* for *C. alpina* L. from here is most likely this.

Oenanthe aquatica (L.) Poir. (64). Appletreewick; G. A. Shaw. Previously only known in Wharfedale below Pool and at a much lower altitude in all its other stations.

Euphorbia platyphyllos L. (63). See *Nat.*, 1947, 23. The cornfield in which the late Dr. J. M. Taylor discovered this was laid down to grass a year or two later, but has since been ploughed again and the spurge has reappeared; W.A.S.

Rumex alpinus L. (63). Many plants along the roadsides near a farm at the edge of Rod Moor, west of Sheffield, alt. 1,035 ft.; F. W. Adams.

R. longifolius DC. (65). Spennithorne; C. M. Rob.

R. maritimus L. (63). Borders of Hatfield Moor; W. Bunting.

Ulmus carpinifolia Gled. × *glabra* Huds. × *Plotii* Dr. (Det. R. Melville) (63). Northcliffe Wood, Shipley; A. M. Smith.

Kalmia angustifolia (63). Thorne Moor, near ' Casson's Garden,' whence it doubtless originated; W. Bunting, det. W.A.S.

Anchusa officinalis L. (63). Quarry between Pollington and Heck; W.A.S. and G. A. Nelson.
Verbascum Blattaria L. (Conf. Brit. Mus.) (61). Waste ground, Hull; E. Crackles.
Linaria supina (L.) Chaz. (64). York; C. M. Rob. ? Introduced.
Parentucellia viscosa (L.) Caruel (62). Eastfield aerodrome, nr. Strensall; about 100 plants on rough ground; J. K. Mitchelson, per C. M. Rob.
×*Mentha Smithiana* R. Graham (Det. R. Graham) (63). Upper part of Rivelin Valley, and roadside at Sheephill, nr. Houndkirk Moor, Sheffield; F. W. Adams.
×*M. gentilis* L. (Det. R. Graham) (63). Edge of mill pond near Rivelin Valley Hospital; F. W. Adams.
Stachys palustris L. × *sylvatica* L. (× *S. ambigua* Sm.) (63). Lumbutts Clough, nr. Todmorden; F. Murgatroyd.
Lamium hybridum Vill. (63). Bankside, Lindrick Dale; F. W. Adams.
Campanula rapunculoides L. (64). Waste ground by R. Ure, near Bridge Hewick; C. M. Rob.
Jasione montana L. (63). Quarry near Butt Stones above Todmorden, in quantity; F. Elliman, per F. Murgatroyd.
Galinsoga parviflora Cav. (61). Garden weed, Leven, introduced with manure; E. Crackles.
G. ciliata (Rafn.) Blake (Det. Brit. Mus.) (61). Bombed site, Hull; E. Crackles.
Erigeron canadensis L. (61). Spurn, 1949. Bombed sites, Hull, 1950-52; E. Crackles. (63) Pollington; W.A.S. and G. A. Nelson.
Hieracium prenanthoides Vill. (65). Ure banks near junction with Cotterdale Beck, between Hawes and Garsdale; C. M. Rob.
Stratiotes aloides L. (63). Still abundant in a dike by the main line south of Doncaster at Potteric Carr and flowering well on July 12th; J. Appleyard, G. A. Nelson and W.A.S.
Butomus umbellatus L. (63). In several stations near Thorne; W. Bunting. (64) Old Eye nr. Birkin; J. Horsman and J. Chisholm.
Potamogeton Friesii Rupr. (61). Leven Canal; E. Crackles.
Allium paradoxum (M. Bieb.) G. Don (64). Waste ground by river, Bridge Hewick, nr. Ripon; C. M. Rob.
Narcissus majalis Curtis var. *patellaris* (Salisb.) Pugsl. (65) Bank of Cover, below Braithwaite Hall; C. M. Rob.
Glyceria declinata Breb. (63). Rivelin Valley; F. W. Adams.
Calamagrostis canescens (Weber) Roth. × *C. neglecta* (Ehrh.) Gaertn. et al. (61) Plants of intermediate appearance growing with the parents at Leven Canal are probably this; E. Crackles.
Bromus arvensis L. (65). Leckby; C. M. Rob.

Bryology (H. Walsh): Records have been received from Mrs. J. Appleyard, Miss K. Mattinson, G. A. Shaw, F. W. Adams, J. Brown, C. D. Pigott.

Hepatics

New Records:

Aneura sinuata (Dicks.) Dum. (62). Near Mallyan Spout, Goathland; J.A.
Cephalozia fluitans (Nees) Spruce (63). Wet ground, St. Ives, Bingley; J.A.
Cololejeunea Rossettiana (Massal.) Schiffn. (63). Anston Stones Wood; F.W.A., C.D.P.

Other Records:

Pallavicinia Lyellii (Hook) Gray (64). Austwick Moss; K.M.M. Recorded here in 1949 and now found in another position.
Moerckia Flotowiana (Nees) Schiffn. (64). Heseltine Gill; K.M.M. Collected on the Y.N.U. meeting at Litton.
Pellia Fabbroniana Raddi (65). Summer Lodge Gill, Swaledale; G.A.S.
Fossombronia Dumortieri (Hub. et Genth.) Lindb. (62). Strensall Common; J.A. Recorded from here by G. Stabler in 1875.
Marsupella emarginata (Ehrh.) Dum. (63). Sconce, near Baildon; J.A.
Lophozia Kunzeana (Hub.) Evans (64). Tarn Moss, Malham. Recorded from here by E. C. Wallace as new to Yorkshire in 1948.
Cephalozia fluitans (Nees) Spruce (62). Eskdale; J.A.
C. Francisci (Hook.) Dum. (62). Strensall Common; J.A. Recorded from here by G. Stabler in 1881.

Cephaloziella hampeana (Nees) Schiffn. (62). Arncliffe Wood, Eskdale; J. A. Perianths present.
Scapania aequiloba (Schwaegr.) (64). Bolton Abbey, near The Strid; J.A.

Mosses

New V.C. Records:

Brachythecium salebrosum B. and S. (63). Firbeck and Roche Abbey; J.B., F.W.A., and C.D.P.
Phascum cuspidatum Hedw. var. *schreberianum* Dicks. (62). Catton, near Thirsk, in a cultivated field; J.A. and C. M. Rob. *Brit. Bry. Soc. Trans.*, 1952.
Amblystegium Kochii B. and S. (65). Wet ground near Leckby Carr, Y.N.U. Excursion, June 1952; J.A.
A. compactum (C.M.) Aust. (63). Anston Stones Wood and Roche Abbey; J.B., F.W.A., and C. D. Pigott.

Other Records:

Dicranum strictum Schleich (63). Kingswood, Roche Abbey; J.B., F.W.A., C.D.P. Sunnydale, near Bingley; J.A. Previously found here in 1915 but not seen since.
Fissidens incurvus Starke (63). Kingswood, Roche Abbey; J.B., F.W.A., C.D.P.
Desmatadon cernuus (Hubn.) B. and S. (63). Shireoaks, old magnesian limestone quarry; J.B., F.W.A., C.D.P.
Tortula marginata Spruce (63). Roche Abbey; J.B., F.W.A., C.D.P.
T. muralis Hedw. var. *aestiva* (P.B.) Brid. (Conf. E. C. Wallace.) (63). Dinnington; J.B., F.W.A., C.D.P.
Barbula hornschuchiana Schultz (63). Sheffield; J.B., F.W.A., C.D.P.
B. revoluta Brid. (63). Firbeck and Lindrick Common; J.B., F.W.A., C.D.P.
Leptodontium flexifolium (Sm.) Hampe c. fru. (64). On roadside near Grassington; J.A. This moss is not often found in fruit in Yorkshire.
Funaria attenuata (Dicks.) Lindb. (63). Northowram, Halifax, *c. fru*; H.W.
Pohlia proligera Lindb. (63). Waste ground, Sheffield; J.B., F.W.A., C.D.P.
Bryum capillare Hedw. var. *elegans* (Nees) Braith. (Conf. E. F. Warburg.) (64). Ingleborough; J.A.
B. argenteum Hedw. var. *lanatum* (Beauv.) B. and S. (63). Limestone wall, Dinnington; J.B., F.W.A., C.D.P. Recorded for V.C. 63 in Census Catalogue but not in Yorkshire List.
Brachythecium glareosum (Bruch) B. and S. (63). Roche Abbey and Sandbeck, on limestone walls; J.B., F.W.A., C.D.P.
Rhyncostegiella pallidirostre (A. Br.) Loeske (63). Anston Stones Wood and Roche Abbey; J.B., F.W.A., C.D.P. (64) Upper Nidderdale; G.A.S.
Plagiothecium latebricola (Wils.) B. and S. (63). On a sycamore, Catty Well Clough, Wainstalls, Halifax; the *forma gemmascens*, with leaf tip gemmae; J.A.
P. denticulatum (Hedw.) B. and S. var. *aptychus* (Spr.) Dix. (64). Grassington; J.A.

Erratum in 1951 Report.—*Webera rothii* (Correns) Roth. (62). Catton, was an error in naming.

The October *Naturalist* has not been received in time for inclusion of Y.N.U. Excursion records in this report.

The British Bryological Society came to Yorkshire for a week-end meeting September 26th-28th. A social evening with exhibits and photographs was held in Leeds University, Botany Department, on the Friday evening. Saturday was devoted to lectures. There were four of these, all of a high standard and very interesting. Many members were shown the electron microscope by Professor Manton, whose lecture was illustrated with slides made with this impressive instrument. On Sunday the party was conveyed by bus to Bolton Abbey. The weather kept fine, a blessing not to be despised during the cold, wet days prevalent at the time. The visiting members appeared to be favourably impressed by the scenic beauty and bryological opportunities afforded by Bolton Abbey Woods.

Ecology (Miss D. Hilary): There is little new work to report and we should like to appeal again for more workers in this branch, especially among the younger members of the Union.

Mr. A. Malins Smith sends the following report on the Moughton juniper:

Mr. C. A. Cheetham has noted that in the area south-east of Thieves' Moss,

where the juniper died off wholesale between 1938 and 1940, there are still a few healthy plants and the position of these has been carefully mapped for future reference. The few surviving bushes are surrounded by many dead ones in apparently similar positions, so that it is impossible to attribute their survival to any special aspect of their environment. Now the juniper on the Horton side has a similar appearance to this and Mr. Cheetham makes the suggestion that the juniper here has come to its present condition by a series of events similar to those which have recently occurred in the area south-east of Thieves' Moss, the stages being: (1) a close stand of juniper, (2) the dying-off of a large proportion of these and the survival of scattered plants among many dead ones. He suggests that on this type of soil it is the presence of stage (1) which needs explanation rather than the present condition. It is, I think, relevant to the consideration of Mr. Cheetham's ideas to note that the dying-off which occurred on Long Scar is practically complete, there being only one living plant there now.

Another relevant consideration is derived from some results which I have recently obtained from summing-up the twelve years' work on Moughton juniper, done during my chairmanship, by the Ecological Committee. Plots were laid down, each 6 ft. by 3 ft., in 1931, and visited at intervals till 1942. Four of these were on limestone similar to that on which the main mass of the Moughton juniper grows. They were chosen at random and had on them a total of sixteen plants varying in size from 2 ins. to about 2 ft., only one of which showed any signs of decay. Of these, eight died in the twelve year period and two were looking moribund on the last visit. The dead and dying plants were not confined to one plot, but occurred on them all, there being one on plot 1, two on plot 2, five on plot 3, and two on plot 4, leaving it bare of juniper. With this story of the steady dying-off I will contrast now the record of regeneration. On the plots during the period nine seedlings or near-seedling plants were found, all of which have disappeared. This dying-out accompanied by inadequate replacement appears, therefore, to be the normal process, but dying-out as wholesale as that as Long Scar formerly, and in the area south-east of Thieves' Moss recently, is, in my opinion, a special phenomenon which has still to be explained.

Mr. Wattam sends his eighth report on the growth of juniper seedlings. The surviving seedling grown in soil from Moughton Fell died in July, 1952, i.e. sixteen years after being sown. Of the three seedlings grown in Mr. Wattam's garden a second one has flowered this year and this, like the one which flowered last year, is male. The third has not yet flowered, but is still flourishing.

Miss Crackles is still continuing her work on the flora of bombed areas in Hull. For two years she has been making lists of plants from about 300 such sites, making notes on frequency. Hull's High Street has produced a list of 134 species including a number of aliens and rare British plants. Buildings are still being demolished and the beginnings of colonisation on bricks and cement are being observed.

Mycology (Miss J. Grainger): During the year the Committee has suffered a great loss in the death of Mr. R. C. Fowler Jones. He had been a member of the Committee for at least 37 years, for his name is included in the minute book which starts in 1915. A group photograph taken in 1916 includes Mr. Fowler Jones along with such stalwarts of an older generation as Geo. Massee, Alfred Clarke, W. N. Cheeseman, Harold Wager, and Mr. and Mrs. Greevz Fysher. There were no young members, whereas to-day the Committee is a cross-section of all ages, as it should be to keep it healthy and progressive. This change is partly due to Mr. Fowler Jones. All the older members of the Committee remember with gratitude his helpfulness and his friendliness. His financing of the Catalogue of Yorkshire Fungi and his generous remembrance of the Union and the Mycological Committee in his will, put both under an obligation to his memory.

One hears with mixed feelings of the removal to Canada of Mr. S. J. Hughes, our referee for Hyphomycetes. We wish him well in his new sphere and we are glad to welcome Dr. Martin Ellis as referee in his place.

The Spring Foray at Thornton-le-Dale and the Autumn Foray at Cloughton were both well attended and profitable meetings. Completed lists for these meetings are still not avilable at the time of writing, but reports with notices of outstanding records will appear in *The Naturalist* in due course, together with the Chairman's address. The thanks of members are due to Professor Chesters for his expert help at the forays and his much appreciated address at the Cloughton meeting.

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,, ,, General Expenses	100 1 2		
	369 14 8		
Less Arrears brought forward from 1951	40 0 0		
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Add Arrears at 20th October, 1952, after making necessary reserve	40 0 0		
Deduct Payments in Advance	14 0 0		
	26 0 0		
	342 4 8		
	27 0 5		
Add Amounts due 20th October, 1952	0 19 6		
	27 19 11		
Less Amounts due 15th October, 1951	2 7 9		
			368 4 8
LEVIES FROM AFFILIATED SOCIETIES			25 12 2
RECEIPTS FROM PUBLICATIONS:			
Durham and Northumberland Ornithologists	20 0 0		
Sales	20 5 10		
			40 5 10
DISCOUNTS RECEIVED			12 1 5
INTEREST FROM INVESTMENTS			21 7 6
Deficit of Income to meet Expenditure for the year carried to Accumulated Fund			59 13 6
			£527 5 1

BALANCE SHEET as at 20th October, 1952

LIABILITIES AND FUNDS

	£ s. d.	£ s. d.
INVESTED FUNDS:		
Booth Fund	100 0 0	
Cheeseman Fund	100 0 0	
Ornithological Fund	100 0 0	
		300 0 0
OTHER FUNDS (Legacy of the late R. C. Fowler-Jones):		
Allocated to Mycological purposes	250 0 0	
Allocated to General purposes	250 0 0	
		500 0 0
ACCUMULATED INTEREST ON ORNITHOLOGICAL FUND		3 3 9
LIFE MEMBERS' ACCOUNT AS AT 15TH OCTOBER, 1951	462 0 0	
Add Subscription of New Life Member—Miss S. H. Knowles	15 0 0	
		477 0 0
PUBLICATIONS FUND AT 15TH OCTOBER 1951	196 16 0	
Less Cost of Special Mycological Publications	89 11 0	
Deduct Sales before 15th October, 1951 (£ s. d.: 41 6 6)		
Deduct Sales during year (£ s. d.: 17 16 4)	59 2 10	
	30 8 2	
		166 7 10
		£1,446 11 7

ASSETS

	£ s. d.	£ s. d.
INVESTMENTS OF FUNDS (NOMINAL VALUES):		
£100 3½% Conversion Stock	100 0 0	
£100 3½% War Stock	100 0 0	
£100 3% British Transport Guaranteed Stock, 1978-1988	100 0 0	
		300 0 0
GENERAL INVESTMENTS (NOMINAL VALUES):		
£200 4% Consols. (Bank of England)	200 0 0	
£159 10s. 11d. 4% Consols. (Post Office)	159 10 11	
		359 10 11
SUBSCRIPTIONS AND LEVIES OUTSTANDING (Less Reserve)	40 19 6	
Less Subscriptions paid in Advance	14 0 0	
		26 19 6
WESTMINSTER BANK LTD.—Current Account		645 11 5
SUNDRY DEBTORS		20 0 0
ACCUMULATED FUND:		
Amount Forward (Dr.)—15th October, 1951	34 16 3	
Deficit for year from Income and Expenditure Account	59 13 6	
		94 9 9
		£1,446 11 7

Audited and found correct,
W. A. WILSON } *Hon. Auditors.*
W. BENNETT }

BOOK REVIEWS

Abraham Trembley of Geneva, Scientist and Philosopher, 1710-1784, by **John R. Baker.** Pp. xx + 259 with 52 figures. Edward Arnold & Co. 35/-.

The excellence of Trembley's scientific work was recognised at its first appearance, and the two hundred years which have reduced the writings of his contemporaries largely to an historical level have increasingly isolated his investigations as a permanent contribution to biology. The long delay therefore in the appearance of a biography of Trembley in English is puzzling, not less so since his articles were published mainly in the Philosophical Transactions. In part at least this may be due to the multitudinous activities of Trembley's life, with the famous researches mainly concentrated in his thirties. In this biography Dr. Baker has skilfully incorporated a thoroughly informed summary and assessment of technical biological work into a background of the science, politics, education and religion of eighteenth-century Europe, and has used all to illustrate the admirable personal qualities of a most attractive man. Trembley is best remembered for his work on the asexual reproduction of Hydra, and although he made other valuable contributions of an exceedingly original nature it is perhaps his curiously modern attitude in research which is most striking. His experiments were carefully planned to illumine every attitude of a problem, the experiments themselves were closely defined and directed to precise ends, and speculation beyond the carefully tested facts was rigorously avoided; as a result his papers can still be read for their intrinsic value. This book allows all biologists to share a feeling of pride in one who was both a fine scientist and a most lovable personality. Unfortunately, the price, despite the excellent production, does appear quite excessive.

T.K.

Climate and the British Scene, by **Gordon Manley.** Pp. 314 with 56 plates. *New Naturalist Series.* Collins, 25/-.

This latest addition to the *New Naturalist Series* maintains the high standard of its predecessors and should be in the hands of every naturalist. It is not a meteorological textbook but presents in a clear manner all the varied factors which determine the circulation of the atmosphere over our islands through the four seasons. Chapters 8 to 10 which deal with the control exercised by landscape features are of special interest to those concerned with investigations on the local distribution of plants while the closing chapter on the effect of climate on human life in Britain is particularly stimulating. The use of 40 photographs in black and white, 41 colour photographs and 75 text diagrams ensures that the principles the author discusses are adequately illustrated. It is quite impossible to summarise the work in a short notice. Wherever the reader lives, he will find his local climatic vagaries explained as for example, why the winter minimum is lower at Bridlington than at Scarborough or why the snowfall is less at Catterick than at Scotch Corner. Professor Manley is to be congratulated on providing a volume which should give pleasure and intellectual entertainment to all who love the countryside.

H.C.V.

Flowers of the Coast, by **Ian Hepburn.** Pp. xiv+236 with 17 colour photographs. 43 monochrome photographs and 14 line drawings and maps. *New Naturalist,* Vol. 24. Collins, 25/-.

This book will be welcomed by the lay reader for whom it is intended, as a readable, easily understandable and beautifully illustrated account of seaside vegetation. It is the third of the *New Naturalist* volumes to be devoted to the plants of a particular environment. The treatment is ecological with an introductory sketch of the physiographical background by Professor J. A. Steers and a concluding chapter devoted to a descriptive guide to the principal plants referred to in the course of the work. The distinctive communities of strand and foreshore, of sand dunes, salt marshes, shingle beaches and sea cliffs, are all described; the stages in plant succession normal to each habitat are traced and the controlling effects on plant life of the special environmental factors peculiar to each type of habitat are clearly explained. Technicalities are used sparingly and defined comprehensibly. A further reduction might with advantage have been made by excluding the cacophonous terminology affected by many plant ecologists. *Spartina* meadows, sea purslane communities and the like, acquire more ugliness than scientific dignity by being dubbed *Spartinetum, Halimionetum* and so forth.

Well-informed systematists may consider the taxonomy a trifle thin. There is no attempt to discriminate between species of such genera as *Salicornia* and *Euphrasia*. The sand sedge apart, species of *Carex* are covered by two sentences: *Viola canina* is not the only dog violet of sand dunes or *Polygala serpyllifolia* the only milkwort and not all the tamarisk is *T. gallica*. The brief treatment of dune slack vegetation, floristically the richest and most varied of any community described, is quite inadequate. With the shining examples of Southport and South Wales to draw upon these should surely have received more extended treatment. School and college teachers of botany and their students will also find room for occasional disagreement in matters unconnected with systematics and ecology. Many will consider the treatment of transpiration problems too teleological and all will be shocked by the statement that cell walls are semi-permeable membranes. The illustration and description of juvenile and adult foliage of *Taraxacum laevigatum*, the change in which is attributed to alterations in soil water content is, in fact, a change common to the leaves of all dandelions and is conditioned not by water relations but by changes in carbohydrate-nitrogen ratios.

Yet, however pedagogues may protest and Olivers ask for more, this is a book which is likely to win wide popular approval and bring pleasure and instruction to the majority of its readers. It is well stocked with information and plainly written, and it owes much to its beautiful and copious illustrations, some of John Markham's photographs especially being exceptionally fine. All in all though it is not one of the outstanding volumes of the series.

W.A.S.

Morphogenesis in Plants, by **C. W. Wardlaw.** Pp. xii+176 with 4 plates and 42 text illustrations. Methuen's Monographs. Methuen & Co., Ltd., 10/6.

The assumption of form is perhaps the most enigmatic phenomenon in biology and the solution of morphogenetic problems is a task of formidable complexity. In this book Professor Wardlaw gives an account of the contemporary outlook on morphogenesis. He stresses the composite nature of the many contributory factors involved in explaining developmental activities, and mature form and structure; and the necessity of co-ordinating information derived from studies of morphology, anatomy, histology and genic control with biochemical, biophysical and mathematical considerations. There are chapters on embryology, the shoot apex and experimental work on it, leaf formation and related problems, mathematical relationships, biochemistry and morphogenesis, gene control and the evidence of genic action in morphogenesis. The results obtained from experimental morphology and their bearing on general issues and theoretical concepts are briefly discussed in a concluding chapter. There is a good bibliography. For advanced students this book will be useful as it is the only one available which gives an up-to-date exposition of this field of study.

W.A.S.

The Naming of Wild Flowers, by **G. H. Browning.** Williams & Norgate, 9/6.

The origin of about 130 names of British plants is given in the text and brief derivations of about 180 others in a Glossary. Derivations include those of scientific names such as Lysimachia and Angelica and of English names such as cowslip and betony. The quality of the work is high and readers may rely upon its thoroughness and accuracy. Surprising conclusions are sometimes reached. We learn that the typically English name primrose originated on the continent and was applied to the daisy as much as to the primrose. Other researches lead to Greek legend, Roman history, and to the mediaeval doctrine of signatures.

The author has felt the fascination of his subject. All interested in plant names should read this book. They will inevitably feel this fascination too.

A.M.S.

Sea Elephant: The Life and Death of the Elephant Seal, by **L. Harrison Matthews.** Pp. 189 with 15 photographic illustrations and map. Macgibbon & Kee, 15/-.

In this objective account of the sealing industry of South Georgia, Dr. Matthews does not spare our humanitarian susceptibilities and his portrayal of the sealers who were his comrades for a considerable time is forthright and devoid of euphemism.

It is comforting to know that the incredibly wasteful practise of slaughtering the bull seals solely for their blubber has not resulted in any diminution in the numbers

of the species since it is polygamous and there is much competition between the virile bulls. On the other hand the successful herd bulls are the most vulnerable since they are found further inland and in this way the survival of the best fitted is forced into reverse, it would seem.

There is a historical survey of the industry and its perils are related at first hand since a ship in which Dr. Matthews worked with the sealers was lost when a sudden gale made her drag her moorings on to a lee shore.

There is a good deal of excellent natural history in the book but by and large it is an account of sealing more than of seals and the author's most trenchant criticism of the practise is not so much that it is a wasteful exploitation but that it brutalises brave men.

E.H.

The Watcher and the Red Deer, by **Richard Perry.** Pp. 188. William Hodge & Co., Ltd., 12/6.

Richard Perry has spent the best years of his life in the company of Ptarmigan, Eagle and Red Deer and has taken full advantage of this opportunity by studying the habits of the latter species at all seasons of the year and under all climatic conditions. In this book he records his observations in a simple lyrical prose which does not disguise his high regard for ' Britain's finest beasts of chase.'

The exact locality of his ' watch ' is not disclosed but it obviously includes some of the rough glens and corries leading up to the great massif of the Grampians and an elevation in excess of 4,000 ft. In these surroundings he is well acquainted with the specialised flora and the birds and animals that inhabit these harsh upland regions. At all seasons of the year he has climbed up into the mountain fastness to study the detailed behaviour of the individuals that make up the great herds of Red Deer and little has escaped his keen powers of observation; one shares also the thrill that the watcher communicates when unusual conditions allowed him to observe great numbers of these magnificent animals at close range as they fed, sparred or chewed the cud, oblivious of his presence.

The watcher leaves these scenes with many misgivings. These great herds are no longer protected by the landowners and their numbers have already been greatly diminished by motorised gangs of bandit-poachers who shoot indiscriminately and leave the crippled and wounded to perish.

Putting aside his natural regret that these fine animals should receive such harsh treatment the watcher wonders if a country that is unable to grow enough food for its citizens can afford to allow this potential reservoir of several thousand tons of venison per annum to be squandered in the black markets.

This book should be read by all who have a regard for the diminishing animal fauna of the British Isles and studied by those responsible for planning our food supplies.

E.W.T.

Green Thoughts, by **Sir Stephen Tallents,** with drawings by Brian Allderidge. Pp. 192. Faber & Faber, Ltd., 1952, 15/-.

This book consists of one long essay and many brief sketches. The essay on the art of the scythe is an important contribution to the literature of country crafts. The shorter articles and sketches cover a wide range of topics bearing on country life. Many of them have already appeared in the literary columns of newspapers and magazines. Individually the sketches are slight, even trivial, but it is the manner rather than the matter which makes this book so delightful. For no matter what Sir Stephen writes about—wood fires, plucking a goose, making purses out of sow's ears, sweeping chimneys, moles, pomegranates, walnuts or sheep—he does it in such a polished style, with such easy, unaffected artistry and charm that his writing harmonises perfectly with the tranquil atmosphere of country life and country pursuits which form the theme of his book. It is his ability to communicate to his reader this atmosphere and the contentment of the spirit which it evokes which makes this book so attractive.

W.A.S.

Enjoying the Country, written and illustrated by **E. Fitch Daglish.** Pp. 232 with 42 illustrations in the text. Faber & Faber, 18/-.

The writer of this companionable book has himself found real enjoyment in country sights and sounds and, as he has already often proved, has an unusual

capacity for describing them to the reader by means of his clear prose and his charmingly varied illustrations. The country lover will be delighted to have so many familiar and intimate scenes recalled to mind in so entrancing a manner. The author displays a wide and accurate knowledge of the habits of animals, and particularly of birds, though there are one or two unaccountable slips, such as the statement on page 16, that at the end of July—' the young cuckoos have gone, to be followed in a week or two by their elders.' In his chapters on insects he introduces the reader to forms of life whose interest may previously have been overlooked. To the day-time naturalist the chapters on the ' Country by Night ' and ' Night Birds ' will come as a revelation, as they describe scenes unfamiliar to many whose experience of wild life has been limited to the daylight hours. An interesting chapter entitled ' Autumn's Monstrous Undergrowth ' cannot fail to direct attention to the often neglected but fascinating study of the larger fungi. The artist's slight but appropriate sketches of birds show a most pleasing delicacy and poise.

G.W.T.

The Changing Wild Life of Britain, by **H. L. Edlin.** Pp. viii+184, with 117 illustrations consisting of coloured plates (4), nature photographs and black-and-white drawings. B. T. Batsford Ltd. 1952. 21/-.

The author of this volume has had a long experience of practical forestry. In previous books he has dealt with tree-planting, tending and harvesting and with the many uses of timber. He has had every opportunity for noting, with an observant eye, the effects of afforestation in Britain and the changes which it has brought about in the countryside, not only by its impact upon social life, agriculture and stock-rearing, but also upon the wild fauna and flora. In the present volume he sets out to chronicle the changes in the wild life of Britain that have arisen from many other causes since man began, first as a hunter, then as an agriculturalist and finally as an industrialist, to make his mark upon his environment. This is a vast subject ranging over a long period of time and requiring much knowledge of past and present conditions to deal with it thoroughly; but the author collects and collates a mass of information and sets it out with clarity and conciseness. The reader may not always agree with his conclusions, but will be grateful to him for grouping together so many varied and interesting facts relating to the native, naturalised and alien fauna and flora of Britain.

Unfortunately, the book is illustrated in the text by many black-and-white drawings, stated to have been ' taken from the works of Thomas Bewick, one of the leading exponents of the art of engraving in wood.' To anyone who knows the beautiful work of Bewick these drawings are a constant irritation, as their coarse lines and black tones blot and obscure the delicate handling of the subjects which give such charm to the work of that great artist and craftsman. This year, 1953, marks the second centenary of Thomas Bewick's birth and special attention is to be drawn, by exhibitions of his original work and reproductions of his wood-cuts, to his wonderful skill and artistry. The illustrations in this book do a great disservice to his memory. The other illustrations vary in quality, but few of them attain the high standard associated with the House of Batsford.

G.W.T.

Common Farm Weeds Illustrated. Plant Productions, Ltd. Pp. viii+172 with 161 photographic illustrations. Butterworth's Scientific Publications, Ltd., Bell Yard, Temple Bar, W.C.2, 1952, 15/-.

The object of this book is to facilitate speedy and accurate recognition by farmers, agricultural students and others concerned, of the common weeds of arable fields and grasslands. Good illustrations are certainly the easiest way of doing this and there can be no question that these are uniformly good and characteristic representations of the plants depicted. About 80 species are illustrated each by two threequarter page plates from photographs, arranged on opposite pages and depicting each species in the seedling or juvenile condition and mature flowering state respectively. Brief non-technical notes on habit, leaves, flowers, distribution, colloquial names and special features of recognition complete each page. The grouping under each habitat is by flower colour and cross references are provided where species are common to both types of ground. With so simple and reliable a guide, to arrive at a wrong identification would seem to be a matter of considerable difficulty.

Poplars, by **T. R. Peace.** Pp. iv+50 with 49 photographic illustrations. Forestry Commission Bulletin No. 19. H.M. Stationery Office, 1952, 7/6.

This publication contains a great deal of useful information on all questions relating to poplars and poplar cultivation in Britain. Choice of site, nursery practice, propagation, planting and maintenance; diseases and pests due to insects, fungi, bacteria and other agencies, and the properties and utilisation of poplar timber are all fully described. There is much of interest here to amateur naturalists as well as professional foresters. To entomologists the section on beetle, moth, sawfly, aphid and dipterous insects causing damage will be of particular interest. Botanists will find especially valuable the account of the systematics of this difficult group and the key for the identification of all the species, varieties and hybrids likely to be encountered, as this section incorporates much information on the characters of varieties and hybrids not available in any British Flora.

A Supplement to the Flowering Plants and Ferns of Cardiganshire, edited by A. E. Wade with a Foreword by Lily Newton. Pp. vi+48. University of Wales Press, Cardiff, 3/6.

Dr. Salter's *Flora of Cardiganshire* was published in 1935 and additions and corrections to that work were kept by the author up to the time of his death in 1942. These together with a number of records from other sources have now been collected together to form the present publication which thus brings the information on the vascular flora of the county up to date. Most of the additions to the flora relate to microspecies, hybrids, varieties and aliens but many new localities are added for previously recorded species. It should be noted that the record for *Orchis pardalina* × *purpurella* from Borth refers to the same plant as the preceding entry under *O. pardalina.*

Insects Indomitable, by **Evelyn Cheesman.** Pp. 205 with 17 line drawings by Arthur Smith. G. Bell and Sons, Ltd., 1952, 12/6.

Intended for those whose knowledge of insects is negligible, this pleasantly designed volume describes in a simple easily comprehended manner the range of form and more particularly the variety of senses that govern the lives of insects. The constant theme is the wonder of it all, and while technical terms have been avoided as far as possible, and scientific names for insects are rarely to be found, the reader is constantly warned of the danger of attributing to insects the senses of man.

Brief accounts of experimental work on insect behaviour illustrate the nature of the various senses of insects, and Miss Cheesman draws on the writings of many workers, sometimes quoting very freely. The book has a discursive and anecdotal style, particularly when discussing the behaviour of wasps and ants where the author recounts many incidents observed during her extensive travels in many parts of the world.

The restricted space available has necessitated much condensation in the text, and it is to be expected that in such circumstances mis-statements can be made or wrong impressions given. On page 28, the statement that malaria (ague) was not re-introduced into England during the 1914-18 war is not correct, and a considerable amount of temporary malaria occurred in coastal districts of Eastern England as a result of infected soldiers returning from abroad into districts where a potential carrier mosquito was to be found. As, however, entomologists are not likely to turn to this volume for information, little harm will be done, and the book certainly has the merit of readability.

Misprints are few, and the book is ornamented by some pleasing line drawings.

J.H.F.

The Young Field Naturalist's Guide, by **Maxwell Knight.** Pp. 144 with 30 photographs and line drawings. G. Bell & Sons, Ltd., 1952, 10/6.

The author tells us that he ' aims at giving to young naturalists advice about all the aspects of nature study which it is usually difficult to obtain without considerable trouble and research.' He is to be congratulated on having gone a long way towards his ideal. Accurate information, useful hints and a great deal of good advice are to be found between the covers of this small book. Glancing through the contents we find reference to the following aspects of the subject—necessary and useful apparatus including lenses, microscopes and binoculars; hints on collecting, identify-

ing, preserving and arranging specimens. The chapter on fieldcraft and suggestions for field work includes a detailed account of making plaster casts of animal footprints. Four pages are devoted to the importance of behaviour in the field. This is followed by excellent advice on starting and running junior nature clubs and societies. Indoor activities are considered in the chapter on the school museum and keeping live specimens. A well selected list of books concludes the work.

The matter is accurate and interesting and the language clear and concise. The photographs are well selected and their reproduction is excellent. There is little to criticise but the author should in future editions revise the figures for diluting formalin given on p. 72. This book should be on the shelves of all school libraries and be accessible to groups of Scouts and Guides.

H.W.

Linger and Look, by **L. Hugh Newman.** Pp. 199, with 40 photographic illustrations. Staples Press Ltd. 11/6.

This book deals in Mr. Newman's habitual style with a considerable cross-section of the invertebrate life of the countryside, particularly the Lepidoptera, to which 160 pages are devoted. Amongst the butterflies the habits and peculiarities of Fritillaries, Browns, Blues, Whites and Vanessas are mentioned. Tiger, Hawk and Silk Moths receive fair attention whilst the latter part of the book becomes more varied, pond life, plant galls and sea-shore life each in turn being brought into the discussion.

There are more typographical errors than usual and one found the fact that the captions to the illustrations were merely reprinted excerpts at length, rather exasperating. The standard of the monochrome illustrations is not exceptional.

To derive material benefit from the book it is apparent that the reader should possess a reasonable all-round knowledge of biology. On that account it would prove somewhat bewildering to a novice and its appeal must, therefore, be limited.

E.D.

The Entomology of Bird Pellets. Collection, Identification and Analysis, by **Philip M. Miles.** Pp. 8, 4 plates. Amateur Entomologists' Society, 1 West Ham Lane, London, E.15, 1952, Leaflet No. 74. Price 1/7½ post free.

A useful pamphlet for the entomologist also interested in ornithology. The subject would not be a suitable one for ornithologists interested in entomology however, as the identification of insect remains in pellets and casts requires a fairly extensive entomological knowledge. Methods of study, a table of food preferences of birds, a key to pellet identification and a bibliography are among the valuable features of this guide. The four photographic plates show disgorged insects and the pellets of thirteen different species of birds.

W.D.H.

The Bird-Watcher's Field Pocket-Book. Seeley, Service & Co., Ltd., 3/6.

This $5\frac{1}{2} \times 4\frac{1}{2}$ in. loose-leaf-file pocket-book contains blank outlines of the principle bird types (e.g. duck, owl, hawk, wader, gull, passerine type) with guide lines to all features of diagnostic importance. The user has merely to fill in details opposite the appropriate guide line, and other available facts in the places provided on each page for notes on size, colour, flight, call, song, nest, eggs and other observations. The sketches are lightly printed to allow for pen or pencil alterations to fit the bird under observation. There are 40 pages with sketches and a dozen blanks for original sketches. Refills are obtainable so that rearrangement and additions can constantly be made. This should prove a very useful addition to the bird-watcher's equipment which will materially assist in the rapid field recording of relevant facts required to permit of subsequent identification at home.

Scientific Journal of the Royal College of Science, Vol. 21. Pp. vi+97. Royal College of Science, London, S.W.7., 10/6.

This publication contains a selection of papers read before the College Chemical, Natural History, and Mathematical and Physical Societies in the Session 1950-1951. Of the seven papers included only one, ' On Dinosaurs,' by Dr. W. E. Swinton, is included in the Natural History Section. The other papers are on ' Unsolved Problems in Crystallography,' by Professor Kathleen Lonsdale, F.R.S., ' What is a Chemical Bond? ' by Professor C. A. Coulson, F.R.S., ' Rational Chemotherapy,'

by Asst. Professor H. N. Rydon, 'Prime Numbers,' by Professor H. Davenport, F.R.S., 'The Age of the Earth,' by Dr. J. McG. Brackshaw, and 'The Age of Newton,' by Dr. D. McKie.

Children's Book of Wild Flowers, by **Nancy Miller.** Pp. 138 with 64 colour plates depicting 79 species. W. & R. Chambers, Ltd., 7/6.

Children's Book of British Birds, by **G. D. Fisher.** Pp. 136 with 64 colour plates. W. & R. Chambers, Ltd., 7/6.

How is it possible to produce so many coloured illustrations of such high quality at such a low price? As value for money it would be difficult to praise these books too highly, for not only are the coloured plates very good indeed but in both the texts are thoroughly sensible. They are informative without being dry, juvenile but without the suspicion of patronage which is sometimes apt to creep into such books. Authors and publishers deserve congratulations and it is to be hoped that these books will meet with the success which they certainly deserve.

Exploring the Hut Country, by **G. D. Fisher.** Pp. 202 with 11 illustrations. W. & R. Chambers, Ltd., 8/6.

The natural history of the English countryside set in the context of a simple story by an author well known to Children's Hour listeners. Suitable for boys and girls of 10 to 12 years of age.

Running Silver, by **Major-General R. N. Stewart.** Pp. 64 with 5 illustrations. W. & R. Chambers, Ltd., London and Edinburgh, 5/-.

A reproduction of the author's Children's Hour broadcast telling the story of the life-history of the Salmon. Suitable for young boys and girls.

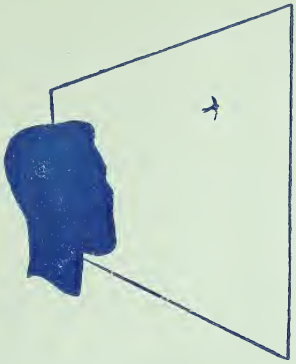
Insect Life. Filmstrip. Produced and marketed by Educational Productions, Ltd., 17 Denbigh Street, London, S.W.1, and East Ardsley, Wakefield, Yorks., 25/-.

This filmstrip contains 20 frames in colour and is based on the Puffin Book of the same title by Arthur Smith. The quality of the reproductions and accuracy of colour are both very good and the pamphlet containing notes on the species depicted, for the use of teachers is well suited to its purpose. The first frame illustrates the typical construction of an insect; the remaining frames show eighteen species mostly familiar types such as dragonfly, grasshopper, lacewing, froghopper, ladybird, water beetle, ants, leaf-cutter bee, tree wasp, hoverfly and housefly.

The current issue of the **UFAW Courier** (price 6d.) is devoted to the subject of bull-fighting. The introductory article by Major Hume gives reasons why the craze for bull-fighting concerns us in Britain. Its relation to ancient Roman entertainments (gladiatorial shows, the throwing of Christians to wild beasts and so on) is brought out in a historical article by a distinguished classical scholar, Professor E. H. Warmington. Eye-witness accounts of modern bull-fights are given by a veterinary surgeon and an agricultural student. A note on the recent changes in the French law on the subject is contributed by a French lawyer.

Two other recent publications by UFAW have been received. The second edition of **Kind Killing** (price 6d.) gives practical instructions on the most humane ways of killing various species of captive animals (dogs, cats, farm stock, poultry, etc.) when the killing has to be done by a layman. A pamphlet on *Facts about Rabbits and Trapping* advocates a vigorous campaign of rabbit destruction as against mere commercial exploitation by trapping, and again emphasises the cruelty of the gin-trap and the humane methods available for putting the policy into effect. These publications are obtainable from UFAW (The Universities Federation of Animal Welfare), 284 Regent Park Road, Finchley, N.3.

The *Birds of Britain* Calendar for 1953 issued by Country Life, Ltd. (2-10 Tavistock Street, Covent Garden, W.C.2, 5/6) contains 24 beautiful reproductions from Eric Hosking's unrivalled collection of bird photographs. There are notes on habits and characteristics of the species represented and the series includes several very fine examples of high-speed flash photographs, that of the Kingfisher perhaps being the most beautiful. Ornithologists especially will be glad to have these finely printed reproductions in this form though they will appeal strongly to all naturalists, photographers and country lovers.



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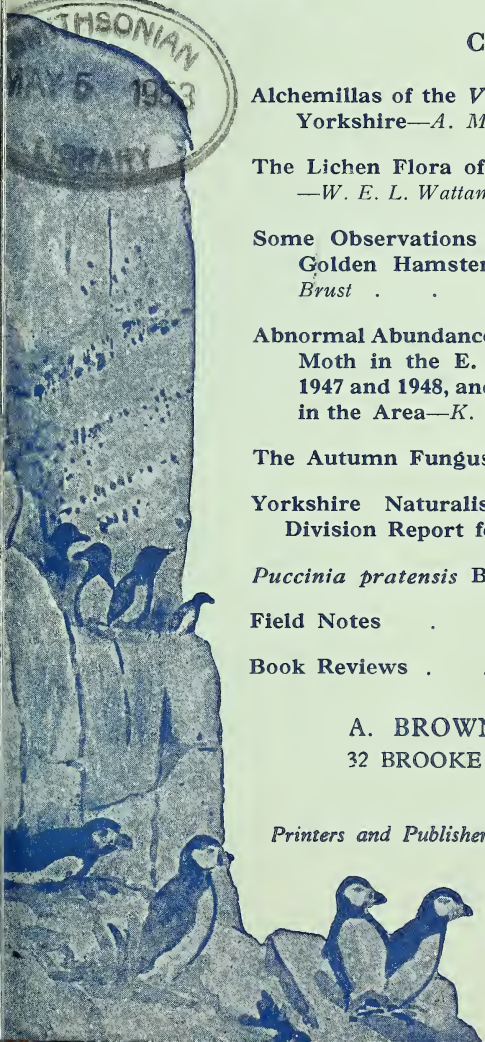

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ALCHEMILLAS OF THE *VULGARIS* AGGREGATE IN WEST YORKSHIRE*

A. MALINS SMITH AND G. A. SHAW

When the *Supplement to the Yorkshire Floras* was published in 1941, the aggregate species *Alchemilla vulgaris* L., the Common Lady's Mantle, had been divided into a number of species of which six were recorded for Yorkshire. These species were undergoing special study both in this country and on the Continent, the late A. J. Wilmott, of the British Museum (Natural History), being one of those who were giving them special attention. Various botanists had collected these newer species in Yorkshire so that the *Supplement* was able to record six species as found in Yorkshire, collected mostly by W. A. Sledge, but also by C. M. Rob, A. Malins Smith and the late J. F. Pickard among Yorkshire botanists, and by the late G. C. Druce and C. E. Salmon from outside the county.

However, at this stage the nomenclature of the group was still confusing, continental authors having given names to forms which were of doubtful standing as species and in consequence only slow progress in recording could be made.

A great clarification of nomenclature was brought about by the work of S. M. Walters, of Cambridge, and as a result of his work Yorkshire is now (1952) known to have eight species, the six of the *Supplement*, one British species *A. filicaulis* Bus. recorded for Yorkshire by Walters (1948 and 1949), and one species new to science, *A. minima* Walters, described from Yorkshire material. One result of this work, however, was a good deal of change in nomenclature, so much indeed that the six Yorkshire species of the *Supplement* all appeared under different names from those previously employed. Walters' conclusions were given in a paper in *The Naturalist* (1948) and more fully in a paper in *Watsonia* (1949), and it has since been possible to make more satisfactory progress in recording this group of species.

One of us (A.M.S.) had made gatherings of these species from 1934 to 1945. These were examined by Walters in 1947, and his identifications under the new names adopted gave a series of authentic records for the localities in which they were found. The late J. A. Horne also collected *Alchemillas* in the years 1944-1946. These were named by experts and were bequeathed to us and are included in our list. One of us (G.A.S.) became an enthusiastic collector of *Alchemillas* and has made, almost entirely from 1946 to the present time, numerous collections which form the bulk of the records here made.

In the following list (which includes species mentioned in the *Supplement*) the records are given under Vice-county headings followed by the initials of the collector. We have included all the records we have made, although very occasionally, e.g. Greenhow Hill for *vestita*, Beckermonds for *minor*, they are later gatherings from localities already recorded in the *Supplement*. S. M. Walters has kindly given us information on the Yorkshire *Alchemillas*, particularly the rarer species, which we have incorporated in this account, and for this information we here record our thanks.

Alchemilla glabra Neyg. (*A. alpestris* Schmidt of *Supplement*).

V.C. 62.—Gurtoff Gill, Boltby, Thirsk 1948; G.A.S.

V.C. 63.—Railway side nr. Thornton station, Bradford 1951; A.M.S. Ingrow nr. Keighley 1947; Crosshills nr. Keighley 1947; St. Ives, Bingley, field below Mansion 1952; Banknewton Road, Gargrave 1947; G.A.S.

V.C. 64.—Austwick; Whernside; Ingleboro'; Moughton; W.A.S. in *Supplement*. Penyghent 2,231 ft. 1906; J.F.P. in *Supplement*. Grass Wood 1934 & 1939 *teste* S.M.W.; Buckden per F.H. 1949; Crummackdale 1940 *teste* S.M.W.; meadows below Oxenber 1940 *teste* S.M.W.; between Feizor & Wharf 1940 *teste* S.M.W.; A.M.S. Pastures near Hawksworth Spring Wood 1944; J.A.H. Bouther Gill, Langstrothdale 1952; Arncliffe 1948; Kettlewell 1947; Kilnsey to Hawkswick 1947; Cracoe 1948; Netherside nr. Grassington 1949; Skyreholme 1947; Bolton Abbey 1950; Cow Close Fell, Littondale, at 1,900 ft. 1948; Draughton nr. Skipton 1947; Ingleton 1948; Dunsop Bridge 1947; Gisburn 1949; between Bashall Eaves & Whitewell 1947; Silsden 1946; Winterburn 1950; Greenhow Hill 1947;

* We have thought it useful to include the few available Yorkshire records from outside the strict limits of our title.

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Austwick Moss 1948; Fourlands Hill nr. Bentham 1950; G.A.S. Malham, abundant 1949; S.M.W.

V.C. 65.—Dent 1944; J.A.H. Cautley Spout 1947; Hebblethwaite Gill nr. Sedbergh 1949; Hardraw Force nr. Hawes 1950; Gt. Sleddale (Swaledale) 1946; Cronkley Bridge, Teesdale 1949; G.A.S.

Alchemilla vestita (Buser) Raunk. (*A. minor* Huds. of *Supplement*).

V.C. 62.—Forge Valley 1932; W.A.S. in *Supplement*. Kepwick Mill nr. Thirsk, 1946; C. M. Rob. Little Gormire, Thirsk 1948; Gurtoff Gill, Boltby, Thirsk 1948; Coneysthorpe 1950; between Fryton & Baxton Howe 1950; G.A.S.

V.C. 63.—Above Greenfield towards Chew Brook Clough, G.C.D., *Nat.*, 1911, p. 322, in *Supplement*; Roche Abbey 1946; J.A.H. Bingley 1950; Gargrave 1947; G.A.S.

V.C. 64.—Greenhow Hill 1893; Clapham, Ingleboro', G.C.D.; W. crags of Ingleboro' at *ca.* 2,100 ft., (1931-1932) W.A.S.; Queen Mary's Dub, Ripon 1939, W.A.S.; all in *Supplement*. Feizor to Wharf *teste* S.M.W. 1940; Clapham *teste* S.M.W. 1940; A.M.S. Tong Park, Baildon 1944; Ghaistrills, Grassington 1945; J.A.H. Kettlewell 1947; Hubberholme 1948; Beckermonds 1948; Arncliffe 1948; Halton Gill 1948; Netherside 1950; Cracoe 1948; Fosse Wood, Starbotton 1948; Slaidburn 1947; Keasden nr. Clapham 1948; between Whitewell & Dunsop Bridge 1947; Burton Leonard 1947; Greenhow Hill 1947; Ripon (Queen Mary's Dub) 1939; Austwick 1948; Baildon 1947; Saltaire nr. Shipley; Winterburn 1950; Ellar Gill, Otley, 1952; G.A.S. Lawn, Malham Tarn House; S.M.W.

V.C. 65.—Micklefell; C.E.S. MS. in *Supplement*. Limestone part of Dodd Fell 1936; A.M.S. Combe Scar, Dent 1944; J.A.H. Between Masham and Thornton Watlass, 1950; W.A.S.

Alchemilla xanthochlora Rothm. (*A. pratensis* Schmidt of *Supplement*).

V.C. 62.—Gurtoff Gill & Gormire, both near Thirsk 1948; G.A.S. Railway embankment near bridge over R. Swale, Catton, 1946; C. M. Rob.

V.C. 63.—Thackley at 220 ft. 1952; A.M.S. Near Druid's Altar, Bingley 1944; J.A.H. Nab Wood, Shipley 1934 & 1948; Lister Park, Bradford 1950; St. Ives, Bingley 1952; riverside, Bingley 1952; Newsholme Dene, Keighley 1952; Gargrave 1947; G.A.S.

V.C. 64.—Grass Woods (1932); W.A.S. in *Supplement*. Grassington 1934 *teste* S.M.W. Bolton Abbey per F.H. 1948; Horton-in-Ribblesdale 1942; Oxenber, Austwick 1940 *teste* S.M.W.; between Feizor & Wharf 1940 *teste* S.M.W.; Cave Haw 1952; Austwick area, several places Bfd. Nats. 1951; A.M.S. Arncliffe 1947; Kilnsey 1948; Hubberholme 1948; Cracoe 1948; Halton Gill 1948; Beckermonds 1948; Cray Gill, Buckden 1948; Bolton Abbey 1950; Fosse Wood, Starbotton 1948; Winterburn 1950; Clapham 1948; Ingleton 1948; Fox Hill, Adel 1952; Baildon 1948; Dodd Fell 1948; Keasden 1948; Fourlands Hill nr. Bentham 1950; G.A.S.
Malham, fairly common 1949 S.M.W.

V.C. 65.—Dent 1944; J.A.H. Lunds nr. Garsdale Head 1948; between Cowgill & Dent 1948; Sedbergh 1947; Hardraw Force nr. Hawes 1950; G.A.S.

Alchemilla minor Huds. (*A. hybrida* Mill. of *Supplement*).

V.C. 64.—Beckermonds near Oughtershaw (1931); W.A.S. Ingleboro'; C.E.S. In *Supplement*. Oxenber, Austwick, 1931; W.A.S. *Loc. cit.* 1940 *teste* S.M.W. Horton-in-Ribblesdale district 1942 *teste* S.M.W.; A.M.S. Austwick 1946 & 1951; Beckermonds 1948; Hubberholme 1948; Long Ashes, Netherside 1948 & 1950; Ingleton towards Crina Bottom 1948; Colt Park 1952; G.A.S. Mastiles Lane 1949; S.M.W. Stangill and Dale Head Farm, Penyghent 1949; S.M.W.

V.C. 65.—Marsett above Semmerwater (1939); C.M.R. & W.A.S. in *Supplement*. Dent district 1944; A.M.S.

Alchemilla minima Walters.

V.C. 64.—Simon Fell 1947; Ingleboro' summit 1949; S.M.W. W. side of Ingleboro' 1949; A. R. Clapham. Simon Fell 1952; G.A.S.

V.C. 65.—Mickle Fell; Cronkley; S.M.W.

Alchemilla Wichurae (Bus.) Stefans. (*A. acutidens* Buser of *Supplement*).

V.C. 64.—Ingleboro' 1931 *teste* Wilmott (and S.M.W.); W.A.S. Bastow Wood, Grassington *teste* Wilmott; A.M.S. both in *Supplement*. Horton-in-Ribblesdale district 1942 *teste* S.M.W.; A.M.S. Waterhouses, Malham 1949; laneside near Dale Head Farm below Penyghent 1949; S.M.W.

V.C. 65.—Grazed turf below Cronkley 1947; S.M.W.

Alchemilla filicaulis Bus.

V.C. 64.—N.W. crags of Ingleboro' 1949; S.M.W.

V.C. 65.—Slope of Mickle Fell above Birkdale Farm, *c.* 1,700 ft. 1947; S.M.W.

Alchemilla monticola Opiz. (*A. pastoralis* Bus. of *Supplement*).

V.C. 65.—Teesdale area 1947; S.M.W.

Our records, which are more detailed than have been given previously for West Yorkshire, fit in well with what is known already about the species concerned. We notice, for instance, that the commonest species are *xanthochlora*, *vestita* and *glabra*. All the other species are comparatively uncommon and some very rare. These rarer species are all confined to limestone soils, at any rate as far as our West Yorkshire records show. They comprise *Alchemilla minor* Huds., a local species, *A. filicaulis* Bus. and *A. wichurae* (Bus.) Stefan., rare, and *A. minima* Walters, which we have found only in Walters' original station on Simon Fell. Yorkshire Teesdale has another species, *A. monticola* Opiz., which, as far as is known, is confined to the Teesdale area. Walters has stated that the record of this plant on Ingleboro' given in the *Supplement* under the name *pastoralis* is an error, the plant being *vestita*.

Although the three commoner species are not confined to limestone, as certain of our records show, yet it is our impression that they are commoner on basic soils. This is indicated by the abundance of records of these three species in V.C. 64 where most of the localities are on basic soils and the much smaller number in V.C. 63 which is easily accessible to us and at any rate the northern part of which has been as carefully searched as V.C. 64. Our ecological notes on two of these species, *glabra* and *vestita*, show them to be integral parts of associations of basic soils.

Altitudinal Limits

As far as our records show, *xanthochlora* ranges from 1,900 ft. on Dodd Fell to 220 ft. by the canal at Thackley, near Bradford. This has previously been described as a lowland species. For *vestita* our records give the limits 1,500 ft. on Dodd Fell and on Combe Scar, Dent, to 172 ft. at Coneysthorpe, V.C. 62. The *Supplement*, however, records western crags of Ingleborough at ±2,100 ft. (W.A.S.). For *glabra* our records range from 1,900 ft. on Cow Close Fell, Littondale, to 350 ft. near Bolton Abbey. Again, there is a higher record, 2,231 ft., on Penyghent (J.F.P.) given in the *Supplement*. For *minor* our limits are 1,100 ft. at Beckermonds to 550 ft. at Austwick. The rare species are montane, but with so few records available their altitudinal limits are not significant.

Ecology

(1) *A. glabra*. This species is a fairly abundant member of the field layers of limestone woodland and is common in some parts of Grass Wood, Grassington. Grass Wood is on the mountain limestone and is essentially an ash wood, but has been much planted not only with conifers, but also with broad-leaved trees, especially Beech and Pedunculate Oak The field layer is essentially that of an ash wood and ranges from an association dominated by Dog's Mercury in the drier and lighter parts to one dominated by Meadowsweet in the damper and more shaded situations. It is in the Meadowsweet association that *A. glabra* takes its place, being in fact co-dominant with *Filipendula ulmaria* here. Details of one such damp, shaded area, follow:

Tree layer	...	Mixed Oak, Ash, Wych-elm, Sycamore.
Shrub layer	...	Hazel.
Field layer	...	Co-dominant: *F. ulmaria* and *A. glabra*.
		Common: *Viola riviniana*.
		Occasional: *Hypericum hirsutum*, Bracken.

In an area with drier soil and more light *A. glabra* was present, but rare, the dominant plant of the field layer being Dog's Mercury.

A. glabra is by no means confined to woodland and by the side of the railway at Thornton, near Bradford, was a constituent of the association of tall grasses which is annually mown in the late summer.

(2) *A. vestita*, though found on both basic and acid soils, is an occasional constituent of limestone grassland and in Bastow Wood, Grassington, in an open treeless area was found as follows:

Dominant	...	Rockrose.
Sub-dominant	...	*Poterium sanguisorba* and *Festuca ovina*.
Occasional	...	*A. vestita*, Primrose, *Geranium sanguineum, Plantago media, Viola hirta, Galium pumilum, Hieracium pilosella, Potentilla sterilis, P. erecta, Thymus serpyllum, Euphrasia* sp., *Luzula campestris, Succisa pratensis*.
Rare	... ...	Earthnut.

A. minor is a constituent of the short turf of grassland on the carboniferous limestone, but no details of the constituents of this association in localities where it is found have been noted by us. Walters, however, has given us the following information about the two species *A. minor* and *A. minima*:

> '*A. minor* is locally abundant between 1,000 and 1,500 ft. on the pavement limestone around Ingleborough. It grows characteristically where there is a *shallow* soil over the outcropping limestone rock. *A. minima* by contrast occurs (in the same region) in the *damper* grazed turf, often mixed with environmentally dwarfed forms of the three common species.'

Though most of our records of *A. minor* agree with the above statement by Walters, yet two of G. A. Shaw's gatherings—(1) from Long Ashes, Grassington, and (2) from Hubberholme—were from deeper soils and from among somewhat taller vegetation in more shaded positions. In both, however, the soil was markedly basic.

The turf from Simon Fell, in which *A. minima* was found, contained also *Festuca ovina, Lotus corniculatus, Cerastium vulgatum, Luzula campestris*, and seedlings of Barren Strawberry.

References

Lees, F. A., Cheetham, C. A., and Sledge, W. A. (1941). *A Supplement to the Yorkshire Floras*. Hull.

Walters, S. M. (1948). '*Alchemilla vulgaris* agg. in Northern England,' *The Naturalist*, 41-43, 1948.

Walters, S. M. (1949). '*Alchemilla vulgaris* L. agg. in Britain,' *Watsonia*, **1**, 1.

Plants at Home, by **Hilda Drabble.** Pp. 128 with 38 photographic plates and text figures. Edward Arnold & Co., 4/6.

This little book by the author of *Plant Ecology* is an attempt to introduce the subject of that work to beginners and young students. It is on the whole successful, as would be expected, since its author is so well versed in the subject. The various habitats, both natural and those modified by man, are dealt with and their vegetation briefly described and illustrated. The artificial habitats include arable land, bombed sites and gardens.

There is perhaps a tendency to oversimplify some of the problems of ecology For instance, students may later have to unlearn some of the statements about xerophytism when they read the results of recent work on the rate of transpiration of xerophytic plants. In another field, that of adaptation for dispersal, E. M. Nicholson's statement in *Birds and Men* that ' among birds there is an almost universal avoidance of blackberries ' would prove surprising to readers of this book.

The figures on the whole are excellent, but the photographs (from the author's longer work) in Figs. 18 and 24 have come out badly in this book.

A high standard of accuracy is maintained, but the definition of transpiration excludes cuticular transpiration and the statement that the weeding of growing corn crops is not possible without damage to the crop sounds very strange to your reviewer who at one time spent many hours and days in this very occupation.

A few blemishes apart, the book can be strongly recommended. A.M.S.

THE LICHEN FLORA OF THE HUDDERSFIELD DISTRICT

W. E. L. WATTAM

ROUGHLY the boundaries of the area which I have termed the Huddersfield District for the purposes of my lichen survey are, to the north and north-west, the Huddersfield and New Hey Main Road running parallel (in part) with the boundary of the Halifax District onwards to Colne Bridge. Within this area are Buckstones Moss, Close Moss, the Black Burn Valley and the Colne Valley. The south and south-west boundaries are (in part) bounded by the Holmfirth to Greenfield Road, then turning towards the Chew Valley, continuing alongside the reservoir at its summit as far as Laddow Rocks, and then crossing to the Heyden Valley side of Holme Moss Road to Woodhead. Within this area are the Standedge ridge, Pots and Pans, the Holme Valley and the Meltham Valley. The boundaries to the east and north-east are (in part) Kirkheaton, Whitley, Beaumont, Lepton, the Kirkburton Valley, and Shelley. Salient points in the boundaries to the south and south-east are Shepley, Upper and Lower Cumberworth, Denby Dale, Ingbirchworth, Gunthwaite and Cawthorne. Also within this area is the Holmfirth Valley, Crow Edge and the Yorkshire portion of the Mersey drainage.

Vegetatively the Huddersfield District is three-zoned as follows: Zone A, the Moss Moor, a part of the Pennines ranging in altitude from 1,700 to 1,000 feet. It is most exposed, the climatic conditions are extreme, the soil consists chiefly of ill-drained peat on which *Eriophorum vaginatum* dominates with few associates. The drier ridges and moor edges are inhabited chiefly by Ericaceous plants. It is a practically treeless region. A characteristic vegetation of *Pteridium aquilinum* with xerophytic associates covers the hill slopes and forms a transition region to Zone B. This latter is the Millstone Grit plateau and occupies the central portion of the district. Altitudes vary from 1750 feet to 1,500 feet. It consists of a series of plateaux with a gradual dip to the South-East. The rocks consist mainly of coarse-grained jointed sandstones, overlaid by shallow pervious soils and in part by thin, relatively dry peat. It is fully exposed to the sun and drying east winds and water is soon drained off. It is a typical, physiologically dry area, consequently the vegetation is xerophytic. The dominant trees are Oak, Birch, Sycamore, Goat Willow, and in certain areas Scot's Pine and Mountain Ash.

Zone C, Coal Measure Area. Altitude is from 200 to 500 feet, except to the South-West where it rises to 1,200 feet. Geologically stratas consist of fine-grained sandstones with extensive deposits of shales and clays. The soils are deep, frequently covered with much humus and retain much moisture. In consequence the vegetation is mesophytic, except on soils over sandstone, and in the higher parts where xerophytes extend from Zone B. The River Holme furnishes a well-marked boundary between Zones B and C. The woodlands are of the mixed deciduous type consisting chiefly of Oak, Beech, Ash, Birch (chiefly *Betula alba*), Sycamore, Mountain Elm, Mountain Ash, Holly, and in some areas pure coniferous belts. During the past thirty years (especially during the war years) considerable felling of aged trees has taken place on the Bretton, Cawthorne and Storths Hall estates. The replanting of these felled areas has been chiefly with coniferous trees, *i.e.* Scot's Pine, Austrian Pine, Cluster Pine, Douglas Fir, Spruce and Silesian Larch.

I have endeavoured to trace the earliest records of our local lichen flora, but without much success. This lack of early records is possibly due to the fact that there were no local students of lichens. The first local records are contained in the second edition of *The History and Natural History of Huddersfield*, published by C. P. Hobkirk in 1868. There is no mention of local lichens in the first edition of this work published in 1859. Neither are there any records for our district published in the list of lichens given in *The Flora of the West Riding*, published in 1862 by Miall and Carrington, or in Lees' *Flora of the West Riding*, published in 1888. There are sixteen species mentioned in Hobkirk's List, reduced to fifteen, due to the fact that his record of *Lepraria flava* belonged to the pseudo-genus *Lepraria* of the older lichen students. This genus is now obsolete. It was based upon the soredial or dust-like condition of lichen growth still so prevalent upon trees and stones. Moreover, few definite localities for his recorded species are given. In February, 1919, the late Mr. S. L. Mosley, F.E.S., informed me that the late Mr. Arthur Swift (then a practising solicitor in Queen Street, Huddersfield) had in his possession a manuscript list of plants of the Mirfield District, compiled by Rev. J. Ismay, Vicar of Mirfield, in 1756, which list included lichen records for the area to which it related. Being on the outskirts of our local area I thought it best to see Ismay's plant list. I

accordingly wrote Mr. Swift thereon. He replied that the vicar mentioned the existence of such list but he (Mr. Swift) could not find it amongst the manuscript in his possession. Mr. Swift stated further that what Mr. Mosley had in mind was a list of lichens compiled apparently by Thomas Bolton of Halifax found by him chiefly in that district. Attached thereto are engravings of thirty-five specimens scratched by him about the year 1770. I subsequently inspected Ismay's manuscript and the drawings referred to. It is quite likely that the vicar corresponded with Thomas Bolton, and that the lichen drawings referred to were included in the list of plants in Watson's *Halifax*, published in 1775, which includes eighty-three lichen records made by Bolton. Mr. Swift declined my suggestion that the manuscript and drawings should be presented by him to the Tolson Memorial Museum. Substantial evidence of the early lichen flora of the Huddersfield District was forthcoming when the executors of the late Dr. George F. Rhodes (a former Medical Officer of Huddersfield) gave to the Tolson Memorial Museum a quantity of botanical specimens, collected both locally and abroad, by apparently Dr. G. Rhodes, the father of the late Dr. G. F. Rhodes. This botanical material came under my inspection whilst I was engaged upon the work of arranging the botanical collections at the Museum. Particularly interesting amongst the eleven species of lichens which had been collected by Dr. G. Rhodes, were five first local records for our district. These records are included in my List.

Besides the densely populated area covered by the County Borough of Huddersfield, the whole of the valleys formed by the Rivers Holme, Mag, Colne and Farnley Beck, and a small portion of the upper reaches of the River Don, and the commencement of the Mersey drainage, with their tributary streams are in considerable parts bordered by industrial developments, chief of which are the manufacture of textiles, engineering and chemicals. Thus the atmosphere is always impregnated by smoke from these industrial activities, and chemical fumes, in varying extremes. The rivers and contributory streams are likewise badly polluted. As a consequence of this, our local lichen flora, as it exists to-day, is always struggling against conditions inimicable to its natural growth. For healthy growth lichens require atmospheric conditions which are practically pure. The burning of coal and coke liberates into the atmosphere sulphur dioxide, which is ultimately turned in the atmosphere to sulphuric acid, which is brought down in the rain. Indiscriminate firing of what few pure heather zones remain, as well as the vegetation of the marginal rough upland pasturage, all tend to the destruction of our present-day lichen flora. The species still existing are mostly depauperated and smoke begrimed, which add to the difficulties of identification. Naturally saxicolous species predominate, foliaceous species having their habitat chiefly on old palings, sandstone blocks, peat and grassy turf. The species which appear to have acclimatised themselves best to present-day conditions are *Pannaria rubiginosa* Del., *Parmelia physodes* Ach., *P. saxatilis* Ach., *Candelariella vitellina* Müll-Arg., *Lecanora conizæa* Myl., *L. polytropa* Schaer., *L. varia* Ach., *Cladonia coccifera* Willd., *C. pyxidata* Hoffm., *C. fimbriata* Fr., *C. gracilis* Willd., *Lecidea granulosa* Schaer., and *L. contigua* Fr.

The classification used is that of the *Monograph of British Lichens*, Parts I and II, by Annie L. Smith, F.L.S., published by the Trustees of the British Museum.

The species previously recorded and my own additions are as follows:

Calicium hyperellum Ach. On aged oak trees, Saville Wood, Kirkburton, uncommon.

Collema glaucescens Hoffm. Clayey shale, Magdalen Clough, Meltham; Raikes Dyke, Holme; Brockholes.

C. pulposum Ach. On calcareous road scrapings, Cellars Clough, Marsden.

Pannaria rubiginosa Del. Sandstone walls, widely distributed, Kirkburton, Woodsome, Meltham, Honley, Denby Dale, Cawthorne.

Peltigera spuria DC. Amongst short grass and moss, sandy road-side waste, Meltham to Isle of Skye. Brought to me by Mr. E. T. Bezant, B.Sc., in March 1950.

Candelaria concolor Wain. First recorded by the late Dr. G. Rhodes, March 1837, 'On wall Greenhead Lane, Huddersfield.' Sparingly on aged oak, Cannon Hall Park, Cawthorne.

Parmelia physodes Ach. First recorded by the late C. P. Hobkirk. Widely distributed on dead and living tree boles and sandstone rocks throughout the Holme Valley, Farnley, Shepley, Upper Denby and Dunford Bridge. The form *labrosa* Ach, on similar habitats, occurs at Holme, Farnley and Dunford Bridge.

P. perlata Ach. First recorded by the late C. P. Hobkirk as occurring on house walls at Kirkburton. The late Mr. S. L. Mosley noted it at Thunder Bridge.

P. scortea Ach. Sparingly on one silicious boulder in bed of River Holme, alongside Holmebridge cricket field, March 1914.

P. saxatilis Ach. The most common of our few foliaceous species, but much affected by smoke, and seldom shows its silvery sheen. Sandstone walls, tree boles, Colne and Holme Valleys, Farnley, Kirkburton, Fulstone, Cawthorne and Gunthwaite. I found it in fruit at Ingbirchworth on the 27th September, 1928. The form *furfuracea* Schaer. under shade trees and shaded rocks at Meltham, Farnley, Marsden, Holme Valley and Cawthorne.

P. sulcata Tayl. Not common, silicious stones of wall beyond Cawthorne brickworks.

P. conspersa Ach. First recorded by the late Dr. G. Rhodes, March 1837, ' On wall, Greenhead Road, Huddersfield.' Apparently vanished.

P. olivacea Ach. First recorded by the late Dr. G. Rhodes as ' on a tree, Grimscar Wood, Huddersfield, March 1837.' Also by the late C. P. Hobkirk as ' on the bark of trees, not common.' I have not been able to confirm either record. Possibly both records were of the species *P. fuliginosa* Nyl.

P. omphalodes Ach. Sparingly on sandstone walls at Wilshaw, Meltham, Holmebridge and Chew Valley.

P. fuliginosa Nyl. Not common on silicious stones of walls at Kirkburton, Fulstone, Gunthwaite and Cawthorne. Var. *laetevirens* Nyl. Sparingly on a few aged oak tree boles in Woodsome Woods.

Cetraria glauca Ach. Gritstone boulders, Holme, Chew Valley, wall surround of gamekeepers' house, Greenfield, Holmfirth Road.

C. aculeata Fr. Sandy peat of roadside waste near to Cook's Study, Crossley Plantation to Ramsden Rocks, Dunford Bridge; also on bare peat Rusby Common, Ingbirchworth. The form *hispida* Cromb. occurs sparingly on Rusby Common.

Evernia prunastri Ach. Recorded by the late C. P. Hobkirk as occurring at Dunford Bridge. I have been unable to confirm.

E. furfuracea Mann. Very sparingly on moor, Ramsden Rocks to Cook's Study, Gritstone Rocks, Holmwood, near Holme, and Greenfield side of Chew Valley.

Ramalina fraxinea Ach. Reported by the late C. P. Hobkirk as occurring at Dunford Bridge. I have been unable to confirm.

Xanthoria parietina Th. Fr. Sandstone, roadside walls, subject to occasional limestone dusting during road repairs, Cawthorne, Holme, Kirkburton.

Placodium flavescens A. L. Sm. First recorded by the late Dr. G. Rhodes as occurring ' on wall, Greenhead Lane, Huddersfield, March 1837.' Now vanished.

P. citrinum Hepp. Uncommon, lime grouting of wall, Cawthorne Brickworks.

P. rupestre B. & R. var. *calva* A. L. Sm. Sparingly on lime grouting of outside coalplace wall, Lumb Lane end of Wheatroyd Lane, Almondbury.

Candelariella vitellina Müll-Arg. Common throughout the district on earth, niches of walls, and on sandstone walls.

Physcia hispida Tuckerm. Sparingly, mossy lime grouting of walls at Cawthorne and Ingbirchworth.

Lecanora sub-fusca Ach. Sparingly, aged oak tree boles, Cannon Hall Park, Cawthorne.

L. atra Ach. On silicious stones of wall of Daiken Brook bridge, Cawthorne.

L. Hageni Ach. Rare, bark of oak tree, Storthes Hall Wood, Kirkburton.

L. galactina Ach. Lime grouting of sandstone walls at Thunder Bridge, Gunthwaite, Ingbirchworth, Holme, Bretton Bar; sub-sp. *dispersa*, Farnley and Honley; sub-sp. *dissipata* Nyl., silicious stone walls, Holme, Dunford Bridge, Ingbirchworth and Netherton.

L. varia Ach. Common on ling stems, old palings and silicious wall stones at Dunford Bridge, Honley, Chew Valley, Holme.

L. conizæa Nyl. Common on oak tree boles, Colne and Holme Valleys, Farnley, Netherton, Kirkburton.

L. symmictera Nyl. Bark of goat willow, oak, black poplar, Marsden, Cannon Hall Park, Gunthwaite and Netherton.

L. sulphurea Ach. Sparingly on sandstone walls, Kirkburton, Honley, Holmebridge.

L. polytropa Schaer. In fair quantity, rough sandstone walls and rock outcrops in the upper portions of the district.

L. parella Ach. Not common, sandstone walls, Marsden, Fulstone, Ingbirchworth, Cawthorne.

Acarospora fuscata Th. Fr. Very sparingly on sandstone walls bordering Farnley-Kirkburton highway.

Pertusaria pertusa Dalla T. & S. Not at all common, aged oak boles, Woodsome, Netherend and Cannon Hall Park, Cawthorne.

P. faginea Leight. Sparingly on beech trees in Storths Hall Wood, Kirkburton.

Bæomyces rufus DC. Sandstone blocks, Dean Wood, Netherton, Royd Edge Brow, Meltham, Ramsden Rocks and Ellentree Valley, Holme.

Cladina sylvatica Hoffm. Sparingly on peaty ground, reservoir embankment, Chew Valley.

Cladonia papillaria Hoffm. On peaty ground, Joy Wood, Kirkburton, and Raikes Dyke, Holme.

C. pyxidata Hoffm. Common on peaty moss-covered ground in most of the woodlands and moorlands in the district. The forms *myriocarpa* Cromb. and *lophyra*, and the variety *chlorophæa* Floerke have also been noted.

C. fimbriata Fr. On humus and mossy decayed turf, Cawthorne, Bretton Bar and Kirkburton. Var. *simplex* Wainio., Joy Wood, Farnley, Dunford Bridge, Meltham and Gunthwaite.

C. cervicornis Schaer. Sparingly on peat, Meltham Moors.

C. gracilis Willd. On peaty ground with mosses, woodlands in the Kirkburton and Holme Valleys, Cawthorne, Hepworth. Var. *chordalis*., ling zones, Kirkburton, Farnley Moor, Deanhead Valley.

C. furcata Schrad. Sparingly on peaty soil at Thunderbridge, and amongst ling near to Sunroyd and West Nab, Meltham.

C. squamosa Hoffm. Sparing amongst mosses, Honley Old Wood.

C. digitata Hoffm. Amongst mosses Honley Old Wood, Kirkburton, Holme and Meltham Valleys.

C. coccifera Willd. Peaty ground, Holme, Colne and Upper Dearne Valleys. The form *phyllocoma* is common on peaty ground, Chew Valley, Farnley, Rusby Common, Ingbirchworth.

C. flabelliformis Wain. Sparingly amongst mosses, Railes Dyke, Holme.

C. macilenta Hoffm. Sparingly, decayed tree stumps, Honley, Holme, Hepworth and Meltham. Var. *scabrosa* Crombe., Meltham, Holme.

Lecidea lucida Ach. Sandstone wall at Hade Edge.

L. coarctata Nyl. var. *elacista* Cromb. Silicious stones of walls throughout the district.

L. granulosa Schaer. On peaty soil amongst ling, and old-established clumps of the the grass *Deschampsia flexuosa*, on the moorlands in the Colne, Holme and Meltham Valleys; also its variety *escharoides* Schaer.

L. uliginosa Ach. Not common on peat, Royd Edge, Meltham; Clowes Moss, Marsden; Chew Valley.

L. parasema Ach. First recorded by the late C. P. Hobkirk as 'not uncommon on trees.' I have only seen it on a beech bole in Storths Hall Wood, Kirkburton: rare.

L. contigua Fr. Common on sandstone rocks and walls throughout the district. The forms *platycarpa* Fr., *nobilis* and *limitata* Leight. have been noted.

L. lithophila Ach. Not common. Silicious stones in streams, Marsden, Holme and Meltham Valleys. The var. *ochracea* Nyl. has also been noted at Stocksmoor and Holme.

L. sanguinaria Ach. Silicious stones of walls, Almondbury, Bretton Bar, Holmebridge and Jackson Bridge.

Bilimbia aromatica Jatta. Sparingly on lime grouting of walls, Honley, Kirkburton and Holmebridge.

B. sabuletorum B. & R. Not common. On dead mosses in wall niches, Kirkburton, Honley and Holmebridge.

Graphis scripta Ach. Recorded by the late C. P. Hobkirk as 'on bark of trees, frequent.' I have not been able to confirm.

Opegrapha atra Pers. Recorded by the late C. P. Hobkirk as 'on smooth bark of trees, occasionally.' I have not been able to confirm.

O. calcarea Turn. Recorded by the late C. P. Hobkirk as *O. saxatilis* DC. Stated to be 'on stones, not very common.' I have not been able to confirm.

Verrucaria muralis Ach. Lime grouting of walls, Kirkburton Valley, Honley, Bretton Bar; not common.

Porina olivacea A. L. Sm. Recorded by the late C. P. Hobkirk as *Verrucaria olivacea* Borr., 'Habitat occasionally on ash trees.' In 1896 the late Mr. S. L. Mosley showed me a specimen on ash bark, obtained by him in Storths Hall Wood, Kirkburton.

SOME OBSERVATIONS ON THE BEHAVIOUR OF THE GOLDEN HAMSTER (*CRICETUS AURATUS*)

JEAN BRUST

THE Golden Hamster (*Cricetus auratus*) is a native of Syria, where a skin and skull were first discovered and described by G. R. Waterhouse in 1839. A female with a litter of twelve captured in 1930 by I. Aharoni near Aleppo (Bond 1933, Adler 1948) was the first authentic record of a living specimen and none has been found since, so that the entire captive stock of the world is apparently derived from this litter. They were first introduced into this country in 1931 and since then they have been bred by fanciers and in laboratories throughout Britain and America (Reynolds 1948).

Owing to the ease of maintenance and the rapidity of breeding in captivity they have been of great use in scientific investigation, and observations of their habits have been recorded by many workers with particular reference to feeding and mating (Bond 1933, Jacobs 1945, Beach and Pauker 1950). The observations recorded here were made on animals bred and kept in the laboratory in connection with studies of the growth and development of the hair.

The stock was raised from a dozen hamsters obtained from outside sources. It was soon found that it was necessary to keep them in a room of constant temperature —25° C.—as they were adversely affected by the cold.

Owing to their gnawing habits they were housed in individual wire cages, supported on removable trays of sawdust. Glass tanks with sawdust covering the bottom were used with success on occasions. Straw was provided for nests.

They were fed by preference in the evening on a mixed diet of rat cake, oats and fresh vegetables with occasional pieces of bread soaked in milk. This diet was supplemented in the case of pregnant and nursing females with pieces of liver or kidney whenever possible, and it was necessary also to give iodised salt, as in the case of breeding does and vixen, to suppress any inclinations of the females to eat their young. Cheese and apple were extras they appeared to relish. During the winter a weekly dose of cod liver oil was found to be beneficial. Each cage was provided with a drip bottle of fresh water.

The Golden Hamster, a rodent of the family Cricetidae, is generally included with other true hamsters in the genus *Cricetus* but some authorities (Ellerman 1941) place it in a new genus *Mesocricetus* together with *C. raddei* and *C. newtoni* owing to the less prominent supra-orbital ridges, the larger coronoid process of the mandible and in particular the absence of an infra-orbital plate. This last feature is considered sufficient by Ellerman for the inclusion of these species in a separate genus, although specimens of *C. newtoni* have been recorded with an infra-orbital plate whilst the other features also are known to be variable.

C. auratus is a small rodent 5 in. to 7 in. in length when full grown, remarkable for its deep golden brown colour in contrast to the grey to brown of the other true hamsters. In addition there is less black on the ventral surface.

The head is short and broad with a short snout overhanging the small mouth, large prominent eyes and moderately-sized ears covered with short white hairs and normally folded against the sides of the head, but erect both in frightened and immature animals. A pair of cheek pouches extend laterally and posteriorly from the mouth reaching when full like a ruff as far as the shoulders. The vibrissae, or sensory hairs, generally black although some around the mouth are white, are a prominent feature of the head. The largest are around the mouth on the upper lip, with a few short ones on the lower lip. A small group is situated on the upper eyelid and one or two long ones on the cheek. The ordinary hair covering the head is golden on the dorsal surface and grey beneath.

The short but thick neck is covered dorsally and laterally with golden hairs and there is a dark band extending round almost to the mid-ventral line.

The thick loose coat of golden hair covering the dorsal and lateral surfaces gives the body a short and broad appearance. Black skin pigmentation situated dorso-laterally on the flanks of both sexes marks the position of a pair of characteristic glands. Each gland covers an area about 5 mm. in diameter in the breeding male and bears stiff black hairs, but in the females and non-breeding males it is smaller with lighter hairs. This gland in the female undergoes changes associated with oestrous and pregnancy cycles. During oestrus there is no secretion but during the rest of the cycle, pregnancy and pseudopregnancy, when the animal is non-receptive to the male, there is a slight secretion, the hairs standing erect to show the area as a

light-coloured patch. In the breeding male, however, the secretion is very considerable and matts the hairs on the surface, whereas in the non-breeding males the secretion is very slight.

The ventral surface of the body is covered with short grey hairs. There is no umbilical gland as found in the European hamster *C. cricetus* (Vrtiš 1930). The female has 7-9 pairs of teats, appearing as small creamy-white conical papillae. In the male the scrotal sacs occupy the area posterior and lateral to the penis and when the testes are fully descended project beside the short conical tail which is barely 1 cm. in length and covered by short white hairs.

The limbs are short with golden hair above and grey beneath. The hands and feet have naked plantar and palmar surfaces, the backs being covered with short white hairs. The first digit of the hand is represented by a clawless pad, whilst the remaining four digits and the five of the foot all bear curved transparent claws.

The grain fields of Syria are the natural habitat of this hamster, but it is so scarce that little is known of its habits. It is supposed to make tunnels with chambers for storing food and possibly for short-period hibernation during the winter (Reynolds 1948). Captivity does not appear to upset them and their natural instincts such as digging, storing and nest-building are still apparent.

In the glass tank with the floor covered with loose sawdust the hamster will always dig furiously at the corners, heaping sawdust around its nest until almost buried. In a similar manner it will bury food under the nest or pile sawdust around it. The nest is fashioned by interweaving the straw, and when available a duster or cotton-wool will be shredded by its hands and teeth so that it can be used to line the nest.

They micturate in one particular corner away from the nest, the young acquiring the habit even before weaning. Faeces are removed by the mouth and thrown clear of the nest, which is always kept clean.

On being fed the hamster will pack as much food as possible into its cheek pouches for transport to its food store where it is forced out by the forepaws. Two animals kept together and each fed with a piece of carrot or rat cake will wander back and forth trying to hide their portions from each other. All hamsters pack food in their pouches but this habit is especially noticeable in pregnant and nursing females who will carry far more food than they will ever eat. One pouch of a female may hold as much as three grams of dry biscuit. This habit develops early in the females and they can in fact be seen packing soon after weaning, but it is much less marked in the male.

Under natural conditions the hamster is nocturnal in habit and in captivity it sleeps in the nest for most of the day. In the evening, besides feeding and cleaning itself with its teeth and forepaws like a cat, it runs about the cage, climbs and swings from the top bars, hanging by one or both pairs of limbs. When allowed to run freely on the bench the hamster moves hither and thither seeking food which it proceeds to pack away and then to hide it in some dark corner or return to the cage to unpack. The animal returns to the food by the shortest route but always returns to the cage by its original route. If this route is made impassable it will not seek another, but will unpack the food anywhere. Thus like many other animals if their routine is disturbed, they become frightened and upset.

When the temperature drops appreciably the hamsters show a tendency to hibernate (Lyman 1948, Chatfield and Lyman 1950). They curl up with the nose tucked beneath the tail to minimise heat loss. They are often found in this position outside the nest and when warmed in the hands exhibit little co-ordination of movement, waving their paws helplessly until they can struggle into a normal standing position, but they still shake and jerk aimlessly for an hour or more before a final complete recovery. At such times the males become infertile, the testes reascending into the body cavity.

The time and extent of breeding in the wild state is not known, but in captivity at a constant temperature (25° C.) they bred at all times of the year, although less frequently during the winter months. Breeding stopped when the temperature fell. Frank and Frapps (1945) and Pecznik (1943-44) found there was no breeding at normal temperatures between October and January, whereas Bond (1945) reports oestrous cycles all through the year but less breeding between June and October. Asdell (1946) corroborates Bond's statement but indicates that pregnancies are infrequent from October to March. Deansley (1938) also reported oestrous cycles all the year round and suggested that the males were the cause of these periods of

infrequent pregnancies. It was noted that, depending upon temperature, the males used in the present work had short periods of reproductive inactivity when the testes ascended into the body cavity from the scrotal sacs.

Full maturity may be reached before the age of three months as earlier pregnancies have been recorded between litter mates (Selle 1945), but the first oestrous cycle occurs at the age of seven or eight weeks (Deansley 1938). The animal is polyoestrous, the cycle lasting four days, whilst gestation takes sixteen days.

Mating usually occurs about dusk, although between 10 p.m. and 9 a.m. has been stated as the time (Deansley 1938). All the animals considered in the present work mated in the evening, generally about 6 p.m. in winter and 10 p.m. in summer.

Owing to the pugnacity of the females it was found advisable to introduce the female into the cage of the male and not the reverse. When first introduced, the female usually investigated the new territory before turning to the male, when she would sniff his flank organ while the male attempted to stimulate her genital region with his tongue. If the female was receptive and in oestrous, she would lie low and flatten her back with the tail extended horizontally. The male would continue to stimulate the female, washing himself in between times. When the female was rigid he would mount her by clasping her round the body, raise his hind legs and curve his abdomen round her tail to insert the penis. He would mount and dismount several times a minute, in fact, and wash himself again in the intervals. The first few mounts are usually abortive, but the successful mount is distinguished by an extra prolonged thrust (Beach and Pauker 1949). Mating takes about a quarter of an hour.

After mating a Y-shaped plug is formed in the vagina, but this was usually eaten by the female.

If the female is not receptive she will turn on the male and bite him in the region of the flank gland or in the genital region. When attacked the male usually sits up on his hind legs with ears erect, holding the forepaws in front of the face and emits a sweet-smelling secretion from the perineal glands.

It is evident from these observations of mating that the flank organ makes recognition possible.

The young are born in the evening or during the night, but in the case of old females of nine months or more the birth may be delayed until morning. During parturition the female lies curled up in the nest and strong contractions pass through the body as the young are delivered. She bites the umbilical cord and licks off the membranes. The afterbirth is eaten.

When two females are together they attack one another by biting any part of the body including the flank organ, and defend themselves in a manner similar to attacked males, with ears erect and paws protecting the face.

The hamster takes great care of its young. If one falls from the nest, the mother will pick it up in her mouth and return it, except during the first two days when she is liable to eat it, especially if the litter is large. The average size of the litter is seven, but the number raised successfully is usually only four or five. Litters born to females over one year old are usually smaller, with a high proportion stillborn. When the litter is a month or more old the young animals move around freely and the mother identifies them by smelling their flank glands.

At birth the hamster is about an inch in length, bright pink in colour, with eyes sealed and ears folded down. On the head and back the first hairs have erupted and the sensory hairs around the mouth are well developed. There is no hair on the ventral surface, limbs, ears or tail. By the second day the pink colour is less marked and the ventral surface and limbs have a covering of short hair. On the third day the tail has a covering of hairs and the back of the hamster appears black except for a small area on the flanks which marks the position of the flank gland. Golden pigment first appears in the hair on the seventh day, but those of the ventral surface remain white. The ears unfold on the fifth day and soon after develop a covering of short hairs on the inner and outer surfaces. The eyes open on the eleventh or twelfth day, about the time of weaning.

The flank organ is not obvious from the fourteenth to the thirtieth day, as the skin is unpigmented and there are no special hairs. It is not until the eighth week after birth when the first coat is lost that they become fully developed. The loss of this coat is gradual and many hairs remain for some time after the new coat is complete. During this time the animal has a somewhat bedraggled appearance.

New coats are grown every three months by the adult hamsters and at the age of six to nine months the coat has its deepest tint, after which it becomes lighter and more yellow.

Hamsters rarely live more than two years and their reproductive powers decline rapidly after one year. Their hair becomes thin and lank, losing the glossy appearance of the younger animal.

No internal parasites were found and no ectoparasites such as fleas or ticks infested the stock. A number of mites were found on one specimen which was sick and eventually died. They were identified as *Hirstonyssus arcuatus* Koch, a blood-sucking mite which has been recorded on *Talpa*, *Mus musculus*, *Rattus* and *Apodemus sylvaticus*. The infection arose through wild mice which invaded the room in which the hamsters were kept, but after poisoning the mice and dusting the hamsters with DDT the mite was eliminated.

The only British Cricetidae are the voles and the muskrat, although the latter has been introduced in recent years (Harrison Matthews 1952). They all belong to the sub-family Microtinae and are burrowing non-hibernating forms with small eyes and ears and moderately short tails and without cheek pouches. The Golden Hamster, however, belongs to the sub-family Cricetinae and differs from these with its blunt snout, large eyes, moderate ears, cheek pouches and very short tail, but appears to have similar habits to the voles and may occupy a similar ecological niche. It is strange that they are so rare in the natural environment when they can be raised so easily in captivity, but this may be related to the pugnacity of the female.

As in the case of the shrews the flank gland is important in relation to reproduction, for it secretes most actively in the fertile male, much less in non-breeding males and non-receptive females, and not at all in receptive females. Harrison Matthews suggests that the secretion in the shrew is repugnant so that the animals keep apart, but when the female is receptive and not secreting she will thus avoid warning off any approaching male. At this time the male scent cannot be repugnant to her; it may even be attractive. It is thought that the animals rub off the secretion on their burrows to keep off trespassers, and I have noticed hamsters rubbing their flanks along the adjacent walls of their cages. But one would expect the secretion of the female to be the greater as her territorial instincts are more marked, whereas this instinct in the male is much less so. The secretion, however, does appear to serve the purpose of recognition between the sexes and between a mother and her young.

Summary

Golden Hamsters were reared in the laboratory at a constant temperature (25° C.) in wire cages or glass tanks, fed on fresh vegetables, dog biscuit and bread, salt and milk, with doses of cod liver oil in the winter, and their general behaviour studied. No ill effects due to captivity were observed and their natural instincts and habits were well developed.

The hamster is most active in the evening when it feeds and runs about. All food is kept clean and separate from the nest and excreta. The hamster, in contrast to the British Cricetidae, possesses cheek pouches which are used to transport the food to a store.

The female oestrous cycle lasts four days, mating occurring about dusk. The young are born blind after a gestation period of sixteen days.

There is a flank organ which is used as a means of recognition between the sexes and between the mother and her young. It is more pronounced in the male and is usually the first part to be attacked by an aggressor. This gland shows cyclical changes, being most active in the breeding male and slight in non-breeding males and non-receptive females, and absent in receptive females. It has been suggested that as in the shrew it may serve as a repugnant warning to other members of the species and used to advertise the territories.

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ABNORMAL ABUNDANCE OF THE LARVAE OF THE ANTLER MOTH IN THE E. LANCS.-W. YORKS. REGION, 1947 AND 1948, AND THE EFFECT UPON BIRD-LIFE IN THE AREA

K. G. SPENCER

The numbers of the larvae of the Antler Moth, *Charaeas graminis* Linn., are subject to considerable fluctuation. In certain years they become so numerous on rough grasslands and upland pastures as to constitute a veritable plague. Such was the case over part of northern England in the summers of 1947 and 1948.

Immediate Results

I first became aware of the abnormal abundance of Antler Moth larvae in East Lancashire on June 1st, 1947, when I was looking for a Curlew's nest on a hillside in North Rossendale, south of Burnley. I suddenly saw that the ground in the area was 'crawling' with caterpillars, whilst further hordes were engaged in making their way to an adjacent field *via* a broken stone wall. They were still in the same region on subsequent days, but it was not until June 9th that the birds seemed to realise their presence. In the evening of that day I noticed from a distance that one field was studded with white flecks, which upon closer examination proved to be gulls. There were about 80 in all; approximately 35 British Lesser Black-backed Gulls and 45 Black-headed Gulls. By June 11th the 'blackheads' had increased to 160+ and the Lesser Black-backs to 75. Rooks and Jackdaws had appeared in force, and, with the gulls, seemed to be revelling in the easy food-harvest. Two days later, however, the Rook, Jackdaw and gull flocks had split, the former moving to higher ground about a mile away, where they had perhaps located another concentration of larvae. Some of the 'blackheads' had disappeared elsewhere, but about 60 Lesser Black-backs still remained, though they, too, had altered position slightly, probably to follow the course of the shifting caterpillar legions. All the gulls seemed to be tiring by the evening of the 25th. Only a few Black-backs drifted idly on a nearby reservoir, whilst several 'blackheads' quartered a new-mown hayfield in search of insects disturbed there. The plague was practically over in East Lancashire. Such caterpillars as had not fallen victim to Rooks, gulls, or ichneumon flies had pupated, or else been swamped by heavy rains. The Rooks and Jackdaws stayed on the hills little longer than the gulls, though for several

more weeks huge Starling flocks, composed almost entirely of immatures, wheeled and drifted across the bleak Pennine landscape. The walls where they and the other species had perched became so ' whitewashed ' that from a distance they took on the appearance of limestone rather than dark, sootstained Millstone Grit.

Despite the natural control factors in the summer of 1947, Antler Moths had a successful hatch in the autumn, and again in 1948 the myriad caterpillars appeared; rather earlier this time. It was May 15th when the presence of a few Black-headed Gulls gave me the first clue to their location. By the 17th, these had been joined by 36 Lesser Black-backs and one Herring Gull, the latter probably a belated passage-bird. There was also a mixed Rook-and-Jackdaw flock in the vicinity, but the most striking feature was the relay of Starlings coming up from the town (Burnley) in search of larvae to take back to their nestlings. A constant stream of individuals passed up and down. About 50 birds at least must have been engaged in this ' shuttle-service,' and some must have travelled a minimum distance of 1¼ mile over open country from their nest-sites. On the following day, too, I saw Starlings on the eastern side of the hills plying back and forth from the Rossendale villages in the same way. I also saw the Lesser Black-backs in the same place as on the previous occasion, but they were inactive and did not seem to have fully ' battened on ' to the caterpillar hordes.

I was away from the district from May 21st to 28th, but when I visited the East Lancashire hills again on the 31st the gulls had certainly ' opened up the offensive.' About 90 Lesser Black-backs were concentrated on a small area in North Rossendale, and my friend Mr. A. Welch has since informed me that he watched 200 by a moorland lake about four miles away on the Yorkshire side of the county border on that day. This latter site was especially favoured by big gatherings assembled for resting and preening purposes. By June 6th the number of gulls under my own observation had risen to 400+, practically all Lesser Black-backs. The same evening Mr. Welch and I went up to the Yorkshire ' sector,' where we found another 500+. We noticed that 90 per cent. of these were immatures. (The immature proportion was indeed high in all the 1948 Lesser Black-back flocks: more so than in 1947.) The total number at the Yorkshire site dropped to 80 on June 11th, though other uncounted packs passed over at dusk. (Just where the Lesser Black-backs roosted was never discovered; sometimes they themselves seemed uncertain what direction to take at nightfall. I suspect that some travelled westwards to a well-established gullery that lies that way, or else went to a certain large reservoir to the north. Nevertheless, several times I saw birds in late June heading towards the *east* at dusk. I found one with a broken wing, beneath pylon wires—probably it had flown against them in the course of nocturnal wanderings.) On June 12th I watched flocks of 120, 80, 50 and 20 Lesser Black-backs feeding at separate points along the county border. I saw another gathering of 100+, of which nearly every one was immature, in West Yorkshire on June 17th, and heard the sound of a great flock across the top of a ridge which hid them from view. In mid-June the Starling packs were nearing their peak; evidently most broods had fledged, their combined strength giving rise to some flocks of well over 500 birds in North Rossendale. A Rook-Jackdaw flock was also about in that area during the plague-period; in mid-May a few adult Rooks used the same technique as the Starlings in taking back supplies for nestlings. The last big flock of gulls seen in 1948 totalled 300 (Lesser Black-backs, W. Yorkshire, July 1st); no further visits were made to that region so it is not known how long any remained, but at least in North Rossendale very few were noted in any part of July.

Antler Moth larvae were not more than usually numerous in the summer of 1949, and consequently there were no really big assemblies of either Rooks, Jackdaws, or gulls on the high hills. Packs of Starlings appeared, but they do so every year whether there is an Antler larva plague or not. Of the gulls, the largest numbers were concentrated on the border areas again; I saw about 100 Lesser Black-backs and 150 ' blackheads ' in the Swinden Water Valley, north-east of Burnley, on May 28th, and there were still a few dozen (' blackheads ' predominating) there on June 18th. About 40 were resting by water a few miles away to the south-east on June 16th. Not more than six of these were adults; about five were first-summer birds, and the rest ' in-betweens.'

I was at a reservoir three miles south-east of Burnley on June 25th. It was a hot day, and in mid-afternoon 43 Lesser Black-backs came over from the north-east. Of these, 34, mainly immatures, alighted in mid-water and bathed and preened

vigorously. Then, without further delay, singly and in small parties, they rose and headed away, mostly to the south. It was the most perfect example of a ' wayside halt ' that I have ever seen.

Later Effects

The big bird-flocks were the immediate and obvious result of the larva plagues, but the long-term effects were probably quite considerable. The influx of *Corvidae* and *Laridae* at the height of the breeding-season creates the possibility of colonies being established in previously unprospected situations. Something of this sort did seemingly take place.

Jackdaws are, for obscure reasons, uncommon in Rossendale. My own observations on this point are confirmed by C. K. Parker (1928) and J. Cassidy (*in litt.*). There are plenty of (apparently) suitable nesting-sites, and the species is abundant in nearby Burnley and Blackburn. It was very interesting when, towards the end of June, 1947, two Jackdaws from the many which had accompanied Rooks from the Burnley area in search of Antler Moth larvae stayed behind in a derelict North Rossendale farm building. They were very aggressive when I approached, and I thought that, though it was by then getting late in the season, they seemed likely to breed. Nothing came of the attempt however—probably they were molested by the marauding youths who are always around the place. Nevertheless it is just possible that some Jackdaws did infiltrate into the Rossendale Valley and establish themselves there. In the winter of 1946 I gave a good deal of time to a study of Rook roosts in that area. Jackdaws are usually very prominent in such assemblies, but in the Valley I found them very scarce. Twelve months later, however, it was my impression that they were more numerous, though still by no means common.

There may be other reasons why the nearest rookery of any size (Crawshawbooth), whose nest-figures for 1945, 1946 and 1947 were 21, 21 and 20, should suddenly spring to 50 in 1948 and 56 in 1949, but it should be remembered that during the Antler larva plague of 1917 Rooks from outside districts joined with the local flocks on the hills (Parker, *op. cit.*, Oakes, 1939), and there was a possibility that some remained to breed in the following year.

We local ornithologists had been expecting the discovery of a Lesser Black-back colony for some time. Three of us had closely observed the activities of the adult birds in the flocks, and were not unduly surprised to find a solitary nest containing one egg of this species in the midst of a Black-headed Gull colony in West Yorkshire on June 17th, 1948, and to learn later that another observer, J. Watts, had found an additional nest with two eggs there at about the same date. I thought that these might be the nucleus of a large breeding-colony. The attempts failed, however, for, as must always be the case in an accessible colony of conspicuous ground-nesting birds on the fringe of an industrial zone, practically all the nests, including those of the Lesser Black-backs, were looted. On June 16th, 1949, at this site, two Lesser Black-backed Gulls were ' anxious,' but no nest was found.

I believe that Antler Moth larva plagues may be more frequent than present evidence suggests. The late C. K. Parker (*op. cit.*) made some ornithological notes during the 1917 ' peak '—which, incidentally, as in 1947, followed a very severe winter—whilst the late F. Allen (1944) gave some account of bird behaviour during a similar plague near Oldham in 1942. Otherwise, little work has been done locally on the subject. Further observations might be interesting.

References

Allen, F. (1944). Notes on a plague of Antler Moth at Greenfield. *Year Book of the North-western Naturalists' Union for* 1941, 1942 *and* 1943, pp, 25-26.
Oakes, C. (1939). *The Birds of East Lancashire*, Burnley.
Parker, C. K. (1928). *Rossendale Birds*, Bacup.

The Young Beekeeper, by **Harry McNichol.** Pp. 127 with 26 line drawings. Frederick Warne & Co., Ltd., 1953, 6/-.

This concise and informative introduction to beekeeping for older children details the year's activities from the capture of a ' wild ' swarm in early June to the end of the heather harvest. The information is skilfully woven into a pleasant narrative, and the scene is set on the edge of the North Yorkshire moors. Some really good line drawings of apparatus and methods of handling assist the reader. J.H.F.

THE AUTUMN FUNGUS FORAY
September 19th-23rd, 1952

W. G. BRAMLEY

SOME twenty members and friends attended the Autumn Foray at Cloughton, together with one or two visitors from Scarborough.

Friday was spent in the Hackness area. The agarics were not numerous or outstanding. *Lepiota mastoidea* Fr. was perhaps the most noteworthy find while *Cortinarius cyanopus* (Secr.) Fr. brought back recollections of Hovingham two years ago.

The next day the Duchy Woods near Cloughton were examined. Little was seen before lunch, the ground examined being rather dry though *Russula emetica* (Schaeff.) Fr. was rather abundant and colourful in one of the older plantations. Later conditions were damper but species were by no means abundant though rather more numerous than at Hackness. A stalked Discomycete provided the best find of the day and later examination shewed it to be *Leptopodia pezizoides* (Afz.) Boud., some dozen specimens being seen.

A wet Sunday morning allowed some time for devotion to the previous days' collections. Hayburn Wyke Woods were visited for a short time in the afternoon. Here the fructifications of *Chlorosplenium* made a fine display on a large Ash log.

Silpho Moor on Monday provided a number of fresh species including *Boletus versipellis* Fr. which has not been recorded for many years.

Rhizina inflata (Schaeff.) Karst. in some abundance round the base of a Scots fir was also an uncommon sight. After lunch some of the party dropped into the valley on the way home. A brief examination of a swampy wood revealed hardly anything but *Paxillus involutus* (Batsch) Fr. which occurred in profusion, literally in hundreds over a small area.

Parts of the country visited were characterised by the abundance of well-grown Holly and search was made for *Marasmius hudsonii* (Pers.) Fr. Success was achieved on the last day. It is not often that this striking and beautiful little agaric growing on dead Holly leaves is recorded. Another interesting exhibit which puzzled those who had not seen specimens before was *Ptychogaster alba* Corda. Several examples in various stages of development were brought in. With the increase in the planting of conifers this species should become more frequent.

Amongst Mr. Palmer's gatherings of Gasteromycetes two are not listed in Mason and Grainger, viz. *Lycoperdon nigrescens* Pers. and *Scleroderma cepa* (Vaill.) Pers. The latter was recorded from Thornton Dale in 1945 and may be more common than records suggest.

Stagonospora tussilaginis Died. on Coltsfoot is also not on the Yorkshire list. There is an almost unworked field in this section for anyone wanting to specialise. It has had little attention in recent Yorkshire mycology.

Tympanopsis euomphalia (Berk. & Curt.) Starb. though not in the list has been gathered in previous years. Always found in association with *Hypoxylon rubiginosum* (Pers.) Fr., Professor Chesters brought in a log of Ash with the fungus in excellent condition.

A number of specimens have been deposited in the Herbarium of the Yorkshire Philosophical Society and others especially Pyrenomycetes in the Botany Dept. of Nottingham University.

***Acilius canaliculatus* (Nicolai) at Hatfield Moor, Yorks.**—In view of the sporadic occurrence of this beetle a record of its presence in some numbers at one of the classic strongholds might be of interest. It was taken in a well-cut, clear drainage channel containing about two feet of water, with some weed, but no filamentous algae. The exact locality is withheld. On October 5th, 1952, 3 ♂♂ and one ♀ were taken in half an hour. During a second visit by P.B. on October 12th, 7 ♂♂ and 11 ♀♀, together with a solitary *A. sulcatus* ♀, were seen in 200 yards of ditch. All the specimens were found in submerged grass at the edges of the ditch (why are so many water-beetles found among grass when it happens to be present?) The species has not been seen here for many years, but it was taken on Thorne Waste in June 1948 by Mr. W. Bunting in some numbers.—W. WILKINSON, P. BLASDALE.

YORKSHIRE NATURALISTS' UNION (VERTEBRATE SECTION) ORNITHOLOGICAL DIVISION

Chairman: E. W. Taylor, C.B.E., F.R.S., &c.

Recorders:

North Riding—*East:* R. M. Garnett, Thornton-le-Dale.
West: J. P. Utley, B.Sc., M.B.O.U., 24 Neile Close, Romanby, Northallerton.
East Riding: H. O. Bunce, 37 Auckland Avenue, Newland, Hull.
West Riding: R. Chislett, M.B.O.U., Masham.
York District: E. W. Taylor, M.B.O.U., The Avenue, York.

Hon. Secretary and Editor of Records:
Ralph Chislett.

Report for 1952

From 1939, when our annual reports were first co-ordinated, I have had one main purpose in view for each year. Each report should include, so far as possible, any matters known to us that would be required by anyone who might undertake the task of bridging the gap from T. H. Nelson's bridgehead of 1906 to the year in which it might be possible to erect a new bridgehead in the shape of a new volume. Of that objective I never lost sight. Now the gap has been bridged, and we are concerned with new piles to be driven annually as supports for a new bridge, the length of which in years no-one can forecast, but which will need to be built someday.

Unavoidably our reports have been governed by the resources and material available. In a regional report, status and distribution must always have first claim. We have gone further and have indicated facts bearing on migrational problems, mainly as data for the use of anyone. Detailed descriptions of behaviour, and of patterns of display, we have been unable to include, and I have thought such to belong more to the domain of the individuals specially so interested, with separate publication when they are ready. To cover everything yearly is plainly impossible. Always there are species with no changes in status or distribution to be reported. There are species also that may find no mention in some years because they have not even occurred. Publication in *The Naturalist*, as well as being economical, has given more permanence to our reports than may be achieved by pamphlet form, whilst reprints have given the convenience possessed by the latter.

We have always thought it worth while to get our reports out quickly, with matters still comparatively fresh, so that they could be studied by contributors, and corrected if necessary, at or before our March meeting and be finally issued before a new year has advanced far. Fresh news is always more interesting than old; and more useful. It is better to be able to confirm matters in the following season than to have to wait for a second year.

The foregoing is intended to meet some comments that have drifted round to me, made by people who are unaware of our history and purposes. I think it will be generally agreed that the continuity of our reports should be maintained. I have thought it advisable not to alter the form of the report for 1952. The report contains no 'padding'; indeed, much matter has had to be 'cut.' If activities continue to grow, as I think they will, we may have to find methods of presentation that will occupy less space. In the meantime, notes to *The Naturalist* always enable special matters to be dealt with in a line or two in the report; and notes of sufficient importance for *British Birds* will I understand soon be dealt with by that journal more quickly than has been the case for the past few years.

The year has had its full share of unusual species. After the early months, with White-billed Divers at Whitby and Scarborough, and a Lesser Grey Shrike at Roche Abbey, most of the first migrants arrived early. The late spring and summer were cool but not abnormal. Birds that bred somewhat exceptionally included the Garganey. Quails occurred more frequently than usual. Three pairs of Gannets reared their single young at Bempton. Four species of Shrike occurred in the year in different places which has not happened before in our time. In August and September three Hoopoes were watched by some of us who had not seen the species in the county before. The Yellow-browed Warbler was new as a species inland, but by no means new at Spurn. The Pallid Harrier shot near Driffield on October 2nd was the first recorded, if not the first occurrence, in the county. A Sabine's Gull occurred near Scarborough for some days in early October, following which gales resulted in records of the Storm Petrel inland, and of many Leach's Petrels.

Among the many interesting recoveries of ringed birds are an Icelandic Pink-footed Goose, a Knot ringed whilst on its southward journey in Norway, and a Goldeneye from Lapland; all recovered in Yorkshire. Details of these and many other matters may be found in the ' classified list.'

The Spurn Bird Observatory

(By G. H. Ainsworth and R. Chislett)

Despite handicaps the observatory had quite a successful seventh year of existence. The visitor's book was signed by 186 people, including the Lord Lieutenant of the East Riding, and a South African ornithologist. Under the auspices of the R.S.P.B. two courses were held in separate weeks of August for members of the Junior Bird Recorders' Club, under the direction of G. R. Edwards, to whose efforts Miss Davies (Editor of *Bird Notes*), after being with them at Spurn for some days, attributed the success of the venture. Yorkshire entomologists visited the observatory during ten days in July.

Hon. Wardens were in charge from April 4th to May 28th, and from July 26th to November 4th. March, July and November might be termed ' border months,' and to get enough competent people to cover them is never easy, yet additional to early appearances of Wheatears and other species, mass migration of fringillidae and some passage of turdidae usually takes place in March. Southward movement of many species begins early in July when numerous young and some adults are wandering past the traps, especially Linnets. Varying proportions of the autumnal Blackbird passage migration often delay until mid-November or later, when Snow Buntings begin to be numerous. It is hoped to have these periods better covered in 1953.

Easterly winds during the autumn of 1952 were generally associated with cyclonic conditions in the south. Anti-cyclonic weather over Scandinavia was less evident in 1952 than in 1951, and there was no concentrated rush comparable to that of early October 1951, but birds passed all the same. On August 14th, after four days of south-westerly winds, on a calm day prior to a turn of the wind towards east, warblers appeared in some numbers, and 60 Willow-Warblers were included in a total of 83 birds ringed in the day. By the following morning the wind had turned south-east, and had swung to north-east before night. Many birds passed in parties down the peninsula, without staying.

During the year to October 31st, 1952, 2,682 birds were ringed of 69 species, which latter was a record number. Several causes contributed to the fall in numbers of birds ringed: presence almost only of entomologists in July; the presence of workmen during much of the year just beyond the end of the Warren trap except at week-ends; the state of the Warren trap of which the design had been altered and the scope reduced following misinterpretation of instructions; and no invasion by any species to equal that of Robins in the previous year.

The inclusion of birds recorded but not captured brought the total of species in the log to 160, with a maximum of 60 in one day on the 26th of October. Such birds included Woodlark, Water-pipit, Eider Duck, Garganey, Long-tailed Duck, Pectoral Sandpiper, Green and Wood Sandpipers, Greenshank and Spotted Redshank, five Terns including the Black, Glaucous and Little Gulls, Great Shearwater, and Leach's Petrel in the air and on the sea.

Many birds have been retrapped after being ringed in previous years. A number of birds have been recovered abroad: four Linnets in France and one in Spain; a Willow-Warbler in France and one in Algeria; a Song-thrush in France and one at Gibraltar Point six days after being ringed at Spurn; and Blackbirds from Ireland, Germany and South Norway. Two more of the Robins ringed in early October 1951 have turned up, both in France.

To single out people for special thanks for gifts and services would be invidious, but we must mention the ladies from a training college who have twice ' spring-cleaned ' the cottage throughout. Gifts have included a cycle, seed for bait, curtains and books.

The *Yorkshire Evening Post* has recently urged that the Spurn peninsula should be made a Nature Reserve under the provisions of the Planning Acts concerning which there has been some correspondence in that journal. Conditions tend to worsen, and each year sees the ternery smaller. Whether all the people interested in the peninsula can work together to preserve its natural amenities is doubtful.

Nevertheless our visitors still have a good time. We can only continue to use what influence we have in the desired direction.

Some bookings are already being received for 1953. Further early bookings will help to ensure adequate coverage. It is necessary that visits by people competent to be in charge should be spread.

TABLE OF BIRDS RINGED AT SPURN

	Total for 6 years to 31/10/51	Ringed in 1951/2	Total to 31/10/52
Rook	1		1
Magpie	6	2	8
Jay	1		1
Jackdaw	6		6
Starling	242	117	359
Greenfinch	815	83	898
Goldfinch	6	1	7
Siskin	3		3
Redpoll	1	2	3
Redpoll, Mealy	9		9
Bullfinch	1		1
Linnet	1052	322	1374
Chaffinch	756	46	802
Brambling	137	26	163
Corn-Bunting	1		1
Yellow-Bunting	52	4	56
Snow-Bunting	1		1
Reed-Bunting	216	67	283
House-Sparrow	548	591	1139
Tree-Sparrow	13	6	19
Skylark	44	10	54
Rock-Pipit	2		2
Tree-Pipit	5	2	7
Meadow-Pipit	217	123	340
Pied Wagtail	2		2
White Wagtail	1		1
Yellow Wagtail	5		5
Great Tit	35	5	40
Blue-Tit	67	8	75
Willow-Tit	1	1	2
Long-tailed Tit	1	2	3
Great Grey Shrike	2	1	3
Woodchat		1	1
Red-backed Shrike	2		2
Spotted Flycatcher	59	10	69
Pied Flycatcher	298	26	324
Red-breasted Flycatcher	6	1	7
Tree-Creeper	1		1
Goldcrest	144	37	181
Chiffchaff	42	8	50
Willow-Warbler	593	214	807
Wood-Warbler	7	1	8
Yellow-browed Warbler	2	1	3
Greenish-Warbler	1		1
Sedge-Warbler	85	30	115
Reed-Warbler		2	2
Icterine Warbler	2		2
Garden Warbler	52	5	57
Blackcap	22	8	30
Whitethroat	450	158	608
Carried forward	6015	1921	7936

	Total for 6 years to 31/10/51	Ringed in 1951/2	Total to 31/10/52
Brought forward	6015	1921	7936
Lesser Whitethroat	25	7	32
Barred Warbler	4	2	6
Fieldfare	5	13	18
Mistle-Thrush	1		1
Song-Thrush	297	61	358
Redwing	39	23	62
Ring-Ousel	7	1	8
Blackbird	869	184	1053
Wheatear	36	22	58
Whinchat	73	18	91
Stonechat	10	1	11
Redstart	189	78	267
Black Redstart	20	4	24
Nightingale	4		4
Robin	873	105	978
Bluethroat	1	1	2
Hedge-Sparrow	160	102	262
Wren	65	42	107
Swallow	100	37	137
Sand-Martin	19	15	34
Swift	1	1	2
Wryneck	6	1	7
Great Spotted Woodpecker		1	1
Cuckoo	67	13	80
Hoopoe		1	1
Long-eared Owl	2	1	3
Short-eared Owl	1		1
Little Owl	1	2	3
Kestrel	5	1	6
Sparrowhawk	12	2	14
Merlin	2		2
Turtle Dove	1		1
Woodcock	3	1	4
Snipe	1		1
Dunlin	5	2	7
Green-Sandpiper	1		1
Redshank	5	2	7
Oystercatcher	1		1
Ringed Plover	52	8	60
Little Tern	52	2	54
Guillemot	2		2
Razorbill	1		1
Corncrake		1	1
Moorhen	1	1	2
Common Partridge	4		4
Red-legged Partridge	5	5	10
Total Ringed	9043	2682	11725

A number of ectoparasites collected from birds at Spurn have been sent to Mr. Gordon B. Thompson of Cambridge who sends the following information concerning them:

HIPPOBOSCIDAE (Bird Flies)

Host	*Ornithomyia fringillina*	*O. avicularia*	*Date*
Rook, Juv.	—	1♂	4/8/1951
House-Sparrow, Juv.	1♀	—	14/8/1950
,, ,,	1♂	—	27/8/1952
Linnet, Ad. ♂	1♂	—	12/8/1952
,,	1♀	—	3/10/1952
Whitethroat	1♀ (gravid)	—	30/8/1952

The Linnet was an addition to the long list of hosts of the two species of Ornithomyia. Mites were noted on the wings of three of the flies. The Rook is not among the hosts commonly recorded.

SIPHONAPTERA (Fleas)

Blackbird 1♀ *Ceratophyllus gallinae* (Schrank) March 1952

This, the commonest British bird-flea, has been recorded from many hosts.

MALLOPHAGA (Bird Lice)

Skylark *Menacanthus ? alaudae* (Schrank)

Blackbird *Menacanthus*

Dunlin { *Saemundssonia variabilis* (Denny) / *Carduiceps zonarius* (Nitzsch)

IXODOIDEA (Ticks)

Blackbird, Juv. Nymph of *Ixodes reduvius* (Linn) 1/10/1952

THE HIGH ROYD TRAP (Halifax S. S.)

The cold spells of late January and of late March brought unusual numbers of Meadow-pipits and Pied Wagtails. The total of birds ringed, 625, made a new record for the trap and covered 32 species. Included were 163 Meadow-pipits, 99 Pied Wagtails, 2 White Wagtails, 4 Grey Wagtails, 20 Yellow Wagtails, 39 Willow-Warblers, 27 Whitethroats, and 32 Chaffinches. Birds retrapped included 2 Pied Wagtails and a Yellow Wagtail ringed in 1951. Other recoveries are included under the heads of the species concerned.

WHARFEDALE N. S. TRAP (W. F. Fearnley)

A total of 587 birds were ringed in the year covering 38 species. Notifications of recoveries of 14 birds have been received; of which the more interesting are recorded under the heads of species hereafter. Remembering that in the early months of 1950, flocked Chaffinches frequented the trapping area and a large number were caught, it is very interesting to find some of the same birds in the same area in each winter since—conjectures as to their breeding quarters are unlikely to be accurate without evidence.

THANKS

Contributors number more than ever. Many have sent me notes at intervals covering periods of a few months which eases the situation at the year end. Especially interesting items have been reported at once, which enables questions to be put whilst events are fresh in the memory. I tender my thanks, and those of my colleagues the other recorders, to all, including any who may have been missed from the following list: G. H. Ainsworth, A. F. Airey, Miss P. Andrews, J. Appleton, A. Baldridge, K. Baldridge, P. Baldwin, T. D. Bisiker, J. E. Beckerlegge, P. G. R. Barbier, C. C. Beedham, Batley N. S., W. Bennett, R. Bramhill, I. G. Brown, G. J. Brown, K. Brown, H. W. Bracken, H. G. Brownlow, Bradford N. S., W. Bunting, H. O. Bunce, C. E. A. Burnham, E. B. Burstall, W. A. Butterfield, D. Buffey, G. Carr, C. A. Cheetham, M. Conder, A. P. Coote, R. W. Crowe, J. A. Chadwick, K. C. Crosbie, V. S. Crapnell, R. W. Crosland, Miss F. E. Crackles, J. Cudworth, P. E. Davis, K. Dawson, R. F. Dickens, F. Dean, I. D. Dougill, A. C. M. Duncan, Miss M. G. Davies, G. R. Edwards, P. N. Edwards, J. C. S. Ellis, G. A. Ewbank, J. B. Fay, K. Fenton, J. K. Fenton, W. F. Fearnley, T. M. Fowler, A. Frudd, R. M. Garnett, A. W. Goodin, E. Grace, J. R. Govett, W. Greaves, A. Gordon, F. C. Griffith, J. S. Griffith, R. Gledhill, W. R. Grist, Harrogate N. S., H. Heald, J. D. Hartley, O. C.

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CLASSIFIED LIST

1. Raven.—A bird flew croaking between Castleton and Rosedale on September 28th. The species was noted on many dates from the Ingleton area northward to Mickle Fell. In the breeding season the eggs of two pairs came to grief; and of the five young hatched by a third pair three young 'disappeared' and only two were reared.

2. Hooded Crow.—A bird occurred at Spurn as late as May 15th; the first of autumn appeared on October 12th; and 25 on December 30th was the maximum noted for one day (G.H.A.). The species was scarce in the north-east in the early months but more numerous in autumn (A.J.W.).

3. Carrion Crow.—During October *c.* 200 roosted above Carlton-in-Cleveland (J.H.). More birds were recorded at Spurn from April 16th (50) to 20th, than in autumn when *c.* 30 on October 24th and 31st were the maxima.

4. Rook.—A bird ringed Giethoorn (Overijssel), Holland, on May 2nd, 1951, was at Pontefract on April 10th, 1952 (E.P.L. in *British Birds*). A fawn nestling with white feet and beak, and blue eyes, fell out of a nest at Haxby and was hand-reared (F.J.). In the East Riding, F. E. Kennington recorded a 33·20 per cent. increase in fourteen rookeries over the number of nests contained in 1945. No large numbers were recorded on any day at Spurn (maximum *c.* 30 on October 25th).

5/6. Jackdaw.—The only marked passage at Spurn took place from October 18th with *c.* 100 as the maximum on the 26th. Spring passage was negligible.

14. Starling.—Adults ringed in Yorkshire have been recovered abroad:

York, 10/12/50, by Bootham School; at Ljungskile, Göteborg, Sweden, 22/5/51.
Thornaby-on-Tees, 13/1/51, by P. A. Rayfield; near Ljungby (Småland), Sweden, 23/6/51.
York, 27/1/51, by Bootham School; Langae (Jutland), Denmark, 21/5/51.
York, 31/1/50, by Bootham School; Emden, Germany, 3/6/51.
York, 31/1/51, by Bootham School; South Beveland, Holland, 25/7/51.
York, 7/2/49, by A. and M. White; near Aalborg (Jutland), Denmark, —/3/52.
Scarborough, 5/3/51, by A. J. Wallis; Woltersum (Groningen), Holland, 21/3/52.
Scarborough, 1/1/51, by A. J. Wallis; near Leningrad, August, 1951.
Thornaby-on-Tees, 26/11/50, by P. A. Rayfield; Drachten (Friesland), Holland, 5/10/51.
Scarborough, 29/1/52, by A. J. Wallis; Kiel, Germany, late September, 1952.
Thornaby-on-Tees, 23/1/51, by P. A. Rayfield; Ligota, Poland, 11/8/51.
Thornaby-on-Tees, 29/12/50, by P. A. Rayfield; Emden, Germany, 11/10/52.
Leeds, 5/1/51, by J. R. Govett, Jever, near Oldenberg, Germany, 1/6/52.

Shorter journeys were made by ringed adult Starlings:

Guiseley, 1/11/51, by D. B. Iles; to Berriedale, Caithness, 19/4/52.
Apperley Bridge, 18/12/50, by R. F. Dickens; to Ramsbottom, Manchester, 21/5/51.
Apperley Bridge, 6/10/51, by R. F. Dickens; to Lockwood, Huddersfield, —/4/52.

Two nestling ringed Apperley Bridge 12/5/52, and 18/5/52, were near Bedale and Addingham respectively on 30/8/52, and 21/9/52.

A Starling at Sedbergh drove off a brooding Song-Thrush and fed the young; the thrush returned but the growing family were fed by both parents, and by the Starling (H.W.B.). Two pairs of Starlings fed young in nests near Leeds on September 14th (H. Walker).

A Starling with a protruding upper mandible fed by a scraping movement along the ground on April 22nd (W.E.L.W.).

A Starling frequently imitated the notes of a Golden Oriole in A. F. G. Walker's garden at Harrogate during December. On December 26th at 2-30 p.m. dense fog caused disorientation among Starlings in the Harrogate area. They festooned trees in Harrogate, and thousands came down in the Knaresborough bus station, and many came down chimneys (A.F.G.W.). Large numbers were roosting again on Huddersfield Town Hall and Church by August 21st; and large numbers roosted at Walkingham Warren (near Harrogate) (A.F.G.W.), and in Wykeham Abbey coniferous plantations (A.J.W.).

The main autumn migration began at Spurn on September 27th. Many birds came in from sea on October 12th at 3-30 p.m. Large movements southerly took place in November and December (T. Jardine). J.P.U. noted a big influx to Northallerton on October 19th.

17. Golden Oriole.—Dr. A. MacKenzie noted one at Cliffe (E.R.) on April 20th and 21st.

18. Hawfinch.—The species bred at Headingley (A. H. B. Lee), in the Apperley Bridge area (R.F.D., D.B.I.); and at Strines, near Sheffield (J.C.S.E.), and in a number of other places. Hawfinches were numerous at Grantley Hall on December 21st to 22nd; 19 being seen as they dispersed from a roost; and 15 were noted at Ripley Castle from December 4th to 6th (A.F.G.W.); and smaller numbers and odd birds at many places in all three Ridings. The occurrence of several on the South Gare breakwater, Teesmouth, on October 21st (J.P.U.) was very interesting.

19. Greenfinch.—The main passage at Spurn occurred from October 24th to 27th and in early November. Large flocks occurred inland at both ends of the year—up to *c.* 700 at Dewsbury Sewage Farm on January 27th, and *c.* 200 on December 14th (A.F., E.G.); *c.* 500 on stubble near Thrintoft on September 25th (J.P.U.); *c.* 500 at Alwoodley on October 15th (J.R.G.). A bird ringed at Spurn on October 20th, 1951, was near Beverley in April, 1952; and one ringed October 31st, 1949, hit some wires near Welwick on July 11th, 1952.

20. Goldfinch.—Reported to be breeding increasingly in a number of areas. A party of 19 near Thorner fed on groundsel on November 14th (P.B.); and six at Haworth on September 7th preferred ragwort seed to thistledown (C.D.R.). Seven in Lunds (head of Wensleydale) on October 23rd, 1951, suggested passage migration (H.W.B.). The species occurred at Spurn more frequently than usual; and birds were noted on most days in September and October, with maximum of ten on October 6th and 7th. J. M. Laws reported *c.* 20 near to Warren Cottage on January 5th, 1952.

21. Siskin.—Of two near Harrogate on April 6th the male sang strongly and was still there on April 13th but silent (J. Rathmell).

25. Lesser Redpoll.—Less frequent than for many years in the York area (F.J.); in the Harrogate area it appears to be getting more numerous (A.F.G.W.). A bird ringed at Spurn on April 26th was retrapped thirteen times; even when brought from the 'wire dump' and released at the cottage it was caught again at the 'wire dump' at the next drive. A few occurred on the peninsula from October 22nd to 26th.

29. Twite.—Seen but not proved breeding in the Osmotherley area (J.P.U.); and in the Huddersfield area (E.C.J.S.). Two occurred at Dewsbury S.F. on August 10th (E.G., A.F.); and one at Swillington on December 27th (K.D.).

30. Linnet.—Four birds ringed at Spurn were recovered in France and one in Spain:

Ringed 21/7/51; Bressuire (Deux Sèvres), France, 3/2/52.
Rinfed 8/8/50; near Nerac (Lot et Garonne), France, 6/1/52.
Ringed 29/4/50; Agen (Lot et Garonne), France, 10/3/52.
Ringed 22/9/52; Capbreton, Landes, France, —/10/52.
Ringed 31/7/52; Echalar, Navarra, Spain, 15/10/52.

Flocks were decidedly less noticeable along the peninsula than usual; but breeding birds were normal. *Circa* 250 passed south on October 18th (G.H.A.).

32/33. Bullfinch.—A hen believed to be of the northern race was seen in Loftus Wood on October 18th (per R.S.). A thorn hedge at Thornbury held 25 Bullfinches on February 16th (B.N.S.).

40/41. Chaffinch.—A male and two females were re-trapped at Apperley Bridge four years each after being first caught and ringed. A bird ringed at Spurn 23/10/50 was re-captured 9/3/52 and 19/10/52 (all times of Chaffinch migration). A large flock of *c.* 300 occurred at Shadwell (J.R.G.) and one of *c.* 200 at Farnley (H.E.A.) both on January 13th. Flocks of *c.* 100 at Swinsty Reservoir on April 20th (A.F.G.W.), and of *c.* 45 (mostly male) at Shadwell on May 3rd (J.R.G.) were late even for continentals. The main autumnal passage at Spurn southward occurred from October 17th on which day *c.* 500 passed (G.H.A.). A bird near Whitby in female plumage sang a hoarse abnormal song on April 11th (A.B.W.). Many Chaffinches ringed in the early months of 1950 were re-trapped in early 1951 and again in early 1952; and several of the same birds have again been caught in January 1953 (Wharfedale N.S.).

42. Brambling.—Last seen inland near Lindley Wood on April 13th (A. H. B. Lee), and at Spurn on April 24th. First noted inland in autumn near Haxby on October 8th (F.J.), and at Spurn on September 30th. A flock of *c.* 24 were at Filey on October 12th when many overseas migrants arrived there (A.J.W.). The largest flocks noted were *c.* 200 going to roost at Winterburn on December 13th (C.D.R.), *c.* 250 near Summerbridge on December 14th (A.F.G.W.), *c.* 100 near Knaresborough during December (J.R.M. and H.J.); and *c.* 150 near Bretton on October 21st (E.G.). A Brambling ringed at Spurn on October 24th, 1949, was found dead at Tongres, Belgium, on October 19th, 1952.

43. Corn Bunting.—Birds were about breeding areas for the species near Ossett on November 2nd (one singing), and on December 7th. A flock of *c.* 30 occurred at Spurn on April 27th.

44. Yellow Bunting.—An immature male from Hornsea (29/9/52) sent by M. K. Taylor to A. Hazelwood is considered by him and Dr. J. M. Harrison to be of the nominate race. This appears to be the first English record of this form although it must often occur. *E. citrinella nebulosa* Gengler was accepted as the name of the British form with Stalham as type locality by majority vote of the B.O.U. Committee as published in *The Ibis* of January 1950.

55. Reed Bunting.—A nest with three eggs at Gorple on May 10th was placed at an altitude of over 1,000 feet (I.M., V.S.C.). There were a few on bracken and moorgrass near Langsett on December 6th (J.C.S.E.).

59. Snow Bunting.—The winter flocks at Teesmouth totalled *c.* 250 on January 1st, and to *c.* 150 on December 26th (A. and K. Baldridge). Last seen at Spurn, seven on April 7th; next seen, one on September 14th. In a flock at Spurn on December 30th one bird carried a yellow ring on left leg and an aluminium ring on right (G.H.A.), two males have been so ringed at Fair Isle (20/10/50 and 29/11/50). There were six on Cherry Cob Sands on September 25th.

Small parties were noted at Danby Beacon, Castleton, Hutton-le-Hole; and one near Ralph Cross on September 18th (E.W.T.). The species was more numerous about Hutton-le-Hole in October than usual (R.W.C.). There were 40-50 at Fen Bogs on February 13th; and *c.* 40 on Fylingdale Moor on November 5th moving south-west (A.B.W.).

Five fed among jetsam by Stocks Reservoir on February 16th (J.K.F.); and D. R. Seaward saw one on Ingleborough at 1,700 feet on February 26th. Three occurred on Whernside on November 9th (P.Y.). A fairly large flock occurred on Cotherstone Moor on January 22nd (J.R.S.).

61. House-Sparrow.—One ringed at Spurn on August 8th, 1950, was recovered at Cleethorpes on May 20th, 1952.

62. Tree-Sparrow.—Flocks were noted of *c.* 150 at Dewsbury S.W. on April 6th (G.C., A.F.); *c.* 50 in Bretton Park on October 21st; and *c.* 40 at Keighley S.W. on December 26th (C.D.R.). Twenty-four on October 17th was the maximum recorded at Spurn.

69. Woodlark.—Three pairs were noted in South Yorkshire on July 12th; young were being fed (F.C.G.). Birds were also seen and heard in the East Riding. Single birds occurred at Spurn on September 5th and 6th, and on October 16th to 18th, close views being obtained (G.H.A.).

70. Skylark.—About 600 occurred at Shadwell on February 3rd (J.R.G.). Following strong easterly winds *c.* 100 were noted at Ossett Spa S.F. on October 15th (G.C.); and flocks of *c.* 100 fed on ploughed land near Wakefield on November 11th, and near Huddersfield on November 18th (E.G.). Large numbers came in from sea to Filey on October 12th; from which date to the end of October *c.* 200 remained about the cliff-top fields (A.J.W.). The main movement southward passed at Spurn from October 18th to 24th.

72. Shorelark.—Six at Teesmouth on January 1st remained and were last noted on February 9th (K. Baldridge, P.J.S.). There were several on the Gare breakwater on October 21st (J.P.U.); and five on December 28th (P.J.S.).

75. Tree-Pipit.—First recorded at Wintersett on April 9th (J.C.), and at Esholt on the 10th (J.B.N.); after a 'probable' seen at Ossett Spa on April 6th (G.C.). April 25th, and May 5th and 6th were the only spring records at Spurn; and a few occurred from September 5th to 11th.

76. Meadow-Pipit.—A bird ringed by the Halifax S.S. (High Royd) on August 13th, 1951, was near Cadiz, Spain, on January 21st, 1951. The first arrived at Malham Moor on March 20th (P.F.H.). On March 23rd *c.* 50 were still at Ossett Spa S.F.; where also there were *c.* 30 on December 26th (E.G.). A nestling ringed by Wharfedale N.S. on June 3rd, 1952, was recovered St. Geours de Marenne, Landes, France, on October 10th, 1952. On September 9th large numbers appeared on the South Gare breakwater at Teesmouth, one Redstart and one Whinchat with them (J.P.U.). The maximum passages at Spurn took place on August 28th and 29th, September 20th and 22nd.

79. Water-Pipit.—A bird that had been dead for some time was found on the Spurn Chalk Bank on December 29th by G.H.A., who sent it to A. Hazelwood.

81. Rock-Pipit.—A few were recorded at Spurn in early October with *c.* 12 as the maximum on October 6th.

84/88. Yellow Wagtail.—First noted at Wintersett on April 9th (J.C.), and at several places in the West Riding on the 10th and 11th. A few occurred at Spurn from April 14th, and in autumn to September 17th. Last seen on October 4th, three at Dewsbury S.F. (H.H.). A bird at Gouthwaite on August 23rd with white throat and eyestripe, and bluish crown, reminded P. G. R. Barbier, when viewed from the side, of a Blue-tit.

89. Grey Wagtail.—A pair nested by the canal bank at High Royd (B.M.). A bird was in a Masham garden on November 9th, where two broods had been reared in the summer. Nestlings at Sleights on July 6th were being fed by two hens and a cock.

90. Pied Wagtail.—Two parties of *c.* 10 each that came up the Calder Valley to Elland S.F. on March 3rd were not in new plumage; but *c.* 20 there on March 13th and *c.* 40 on March 16th were all in fresh plumage (G.R.E.). A flock of *c.* 60 settled in a small garden at Romanby on March 30th (J.P.U.). Autumnal parties noted were *c.* 40 at Ossett Spa on August 20th, and *c.* 50 at Cooper Bridge S.F. on the 21st (G.C.); *c.* 40 at Stanley S.F. on August 21st (E.G.); *c.* 40 at High Royd on September 2nd and *c.* 50 on the 16th (G.R.E.). Ten was the maximum noted at Spurn, on October 4th.

91. White Wagtail.—Birds were noted in a number of places from March 16th, one at Ossett Spa S.F. (E.G., G.C., A.F.); up to April 27th, one at Dewsbury S.F. (H.H.), and one at Ramsgill (J.R.M., H.J.). Single birds occurred at Horbury S.F. on September 13th (C.N.); and at Gouthwaite on the 14th (J.C.S.). At Spurn birds were identified on April 13th (B.M.), 22nd and 25th (R.M.G., R.F.D.).

96. Nuthatch.—Bred in three sites at Roundhay, Leeds (J.R.G.); and a pair occurred in a garden in residential Sheffield on January 11th and November 1st (D. R. Wilson). Two pairs reported at Buckden on April 15th and 22nd (K.G., D.F.W.) were higher up Wharfedale than I should have expected.

97/98. Great Tit.—Ringed birds recovered include one ringed at Apperley Bridge on November 12th, 1947, and recaptured March 19th, 1952 (R.F.D.). An adult ringed by R. Slater at Loftus on January 25th, 1952, was found dead in a disused room at Ebberston on October 21st (E.P.L., per Mr. Baker). Movement was apparent at Spurn from October 20th to 29th—eight noted on the 21st.

99/100. Blue-Tit.—One ringed Leeds on January 2nd, 1951, was at Sheffield on April 2nd, 1951 (J. R. Govett). Two ringed Apperley Bridge on December 15th, 1950, and March 15th, 1951, were respectively at Harrogate on January 14th, 1952,

and Bingley on April 21st, 1951 (R.F.D.). Six occurred at Spurn on October 5th, and odd birds at intervals.

108/9. Willow-Tit.—J. C. S. Ellis recorded the species in the Barnsley area on March 20th and November 28th. One occurred at Spurn on June 29th (G.H.A.).

111. Long-tailed Tit.—Parties of 24 at Hook Moor on October 5th (P.B.), *c.* 30 on the Bretton Estate on July 8th (E.G.); and *c.* 30 by Hornsea Mere on December 31st (F.E.C.) were unusual. Two occurred at Spurn on October 22nd and 23rd and were ringed.

113. Lesser Grey Shrike.—See *Naturalist* of July, 1952, for details of a bird of this species seen near Maltby by Mr. and Mrs. A. C. Hoyle and R. Bramhill on several dates in January and February.

114. Great Grey Shrike.—This species has been noted: one on October 11th on the Gare breakwater, Teesmouth (J. Hyatt); two apparently male and female, near Kiplin on October 20th (J.P.U.); one at Spurn on October 12th, 14th, 15th and 16th; one at Thornton Marishes on December 14th (M. Conder); and on December 26th one near Whitby (A.B.W.) and one at Gouthwaite which was also seen on the 27th (A.F.G.W.).

116. Woodchat Shrike.—A bird was put into the Warren trap at Spurn on May 13th by J. A. Chadwick and J. B. Nelson in pouring rain. Its plumage soon dried in the cottage and in excellent condition it was also inspected by W.F.F. H.J.W., O.M.P. and G.H.A.

119. Red-Backed Shrike.—A pair was reported near Oswaldkirk towards the end of September, but on a visit early in October only the female was seen (A. Gordon). Single females or juveniles occurred at Spurn on August 16th and on September 29th.

120. Waxwing.—A small flock at Scarborough in January fed mainly on berries of viburnum. Two at Scarborough on November 26th ate haws (A.J.W.). At Whitby 40-50 occurred on January 31st, and one on February 6th; and two at Ruswarp on December 26th (A.B.W.). A bird in Thornton-le-Dale village from February 18th to April 18th was seen to feed on cotoneaster berries; and once, on April 18th, on flying insects (R.M.G.). One was reported at Wilton (near Thornton-le-Dale) on November 13th by J. T. Green; and four were at Thornton Dale on December 23rd (R.M.G.).

121. Spotted Flycatcher.—The earliest record comes from Bretton Park on May 6th (E.G.). First appeared at Malham Tarn on May 13th (P.F.H.), and at Bolton Abbey on May 18th where two broods were fledged in the same box on June 28th and August 3rd (C.F.T.). On July 19th, H.J.W. and Mrs. O. M. Pennock saw a completely white bird being fed with two normal juveniles. Young were being fed in a nest at Kettlewell at over 1,000 feet altitude on June 9th (P.B.). Last reported inland at Harrogate on September 17th (A.F.G.W.). Passage birds at Spurn occurred from May 10th to 21st, and one on June 1st; a few passed in autumn with the last on October 3rd.

123. Pied Flycatcher.—First noted at Ripley on April 12th (Miss M. Wray). On April 14th, T. D. Biseker, G.H.A. and R.C. listened to a cock near a known breeding-hole near Masham. Subsequently T.D.B. watched this bird fight with a male Redstart presumably for the nearby hole. The flycatcher appeared to be getting the worst of the encounter but was in occupation of the hole on May 13th with a mate. The species was fairly numerous in its breeding haunts this year but passage birds at Spurn were under average—only two on May 3rd and one on May 25th in spring; from August 8th to October 3rd in autumn with maximum 12 on September 10th.

125. Red-Breasted Flycatcher.—Juveniles occurred at Spurn on October 1st and October 20th (ringed).

126/7. Goldcrest.—Common in woods about Eccup in winter but scarce in summer (A. H. B. Lee). Occurred at Spurn—one on April 11th, three on April 12th; and in autumn from September 9th after which usually noted, with main arrivals from September 30th when the maximum (*c.* 50) appeared. Three flitted in a thorn hedge on the cliff at Filey on October 18th (A.J.W.). One on September 13th, and seven on October 4th, were noted on the South Gare at Teesmouth (K. Baldridge).

129/131. Chiffchaff.—The earliest records came from the shores of Wintersett Reservoir on March 18th (M. N. Rankin); one near Knaresborough on March 20th (H. Jowsey); and one each on March 23rd from Roche Abbey (A.C.H.), and Scampston (R.M.G.). There are many reports of birds heard singing in late August

and September, especially from the Halifax area; and of one at Carlton-in-Cleveland on October 8th (J. Hyatt). Occurred at Spurn in spring on April 5th to 11th, and May 1st; and in autumn from September 5th to October 23rd, with maximum of ten on October 20th.

132/3. Willow Warbler.—Two birds ringed at Spurn have been recovered abroad:

Ringed October 1st, 1951; recovered Behina, Touggart, Algeria, February 15th, 1952.

Ringed August 14th, 1952; recovered Ondres, Landes, France, September 19th, 1952.

April 8th near Gargrave; and April 9th in Chevet Wood (A.C.L.), near Haxby (F.J.), at Camerton, East Riding (J.M.L.), and in my garden at Masham, were the earliest inland appearances. For one to appear still earlier at Spurn on April 6th was unusual. Up to 30 were seen daily at Spurn from April 11th to 16th with the last of the spring passage on May 17th. Southward passage began on July 26th, with maximum of *c.* 100 on August 14th, and continued until early October.

135. Wood Warbler.—One at Thornton-le-Dale on April 19th was the first recorded. May 9th and September 15th were the dates of the only two occurrences at Spurn.

137. Yellow-Browed Warbler.—On September 28th a very small phylloscopine warbler was seen at Knaresborough S.F., flitting about a sycamore, at ranges down to five yards, by J. R. Mather, H. Jowsey and A. Mason. The small size, double yellow wing-bar, and eyestripe were clearly seen on two occasions. I caught and ringed a Yellow-browed Warbler at Spurn on the following day and T. M. Fowler photographed it as it lay in my hand.

145. Grasshopper Warbler.—April 12th, when one reeled near Roche Abbey in the evening was an early date. Birds were also heard in spring and summer near Wakefield, Ripon, Thorne, Skelton-in-Cleveland, Cliffe (East Riding), and Helmsley where A. Gordon reports that at least two pairs nested.

149. Reed Warbler.—Recorded at Fairburn, Swillington Ing, Bottomboat, and Ossett Spa S.F. and bred in several parts of the area. Was present again at Scarborough Mere. The Kelsey Hill colony has disappeared as the result of gravel-working; but in other parts of the East Riding and South Yorkshire the species was normal. Single birds were ringed at Spurn on August 8th and 11th.

153. Sedge Warbler.—A bird occurred at Swillington Ing as early as April 14th (K.B.). Always present at Spurn from April 24th to September 8th. P. J. Stead flushed one from the S. Gare breakwater on August 6th.

159. Barred Warbler.—one was ringed at Spurn on October 2nd and another on October 3rd. One measured 6½ inches and the other 6¼ inches against the total length given in the *Handbook* of 6 inches; but other measurements and wing-formulae conformed (R.C., R.S., R. S. Pollard, T. M. Fowler).

161. Garden Warbler.—One occurred in Coxley Wood near Ossett on April 13th (G.C., A.F.); and one sang near Cliffe on the 17th (E.B.B.). At Spurn only one was recorded in spring (April 17th); in autumn on six dates from August 13th to October 1st.

162. Blackcap.—A. J. Wallis ringed a bird in his garden on March 17th which was seen in another Scarborough garden on the 25th. There were two males at Farnley on April 9th; and a nest with four eggs on April 30th (D.B.I.). Five nests were known to R. F. Dickens in one small part of the Apperley Bridge area. There was a Blackcap on the S. Gare breakwater on October 4th (K. Baldridge); and one in Coxley Wood on October 20th (E.G.). Recorded at Spurn on five days in spring from April 19th to May 22nd; in autumn only recorded on September 14th and October 1st.

163. Common Whitethroat.—A bird ringed at Spurn on September 7th, 1951, was at Saujon (Charente Inf.), France, on September 20th, 1951. A male bird ringed July 21st, 1950, was recaptured on July 7th, 1951, and on April 26th, 1952. Twelve birds caught in 1951 were recaptured in 1952. April 13th was the date of the first Spurn record in spring, and October 1st of the last in autumn. Movement was apparent from July 26th to 31st with maximum noted on the 29th. August 14th, 30th, and September 6th were the other days of major numbers.

164. Lesser Whitethroat.—First noted on April 23rd singing at Esholt (J.B.N.). In the Apperley Bridge area the bird was fairly common (R.F.D.), elsewhere it appeared to be very sparse as usual. From April 15th to May 16th odd

birds appeared at Spurn on many days; one only recorded in autumn, on September 20th.

173. FIELDFARE.—The species was reported very numerously in the early months in and about the Nidd Valley and the Wakefield area. Large numbers occurred in Nidderdale, Wharfedale, Littondale and Langstrothdale on April 11th (J.K.F., B.N.S.). Near Addingham there were *c.* 100 on May 1st (C.D.R.). Last recorded in spring on May 12th at Spurn. A bird appeared above the cottage at Spurn on September 10th (R.F.D.); and from the 27th, birds appeared on most days, with maximum numbers from October 16th (*c.* 400) to 26th (*c.* 200) which were still there on November 1st. At Chopgate and Carlton-in-Cleveland birds were incoming by October 4th (P. A. Rayfield) and 5th (J Hyatt). Over Guiseley *c.* 250 flew northward on October 8th (D.B.I.). On October 12th flocks aggregating to *c.* 1,000 were in Upper Nidderdale (A.F.G.W.). Thereafter large flocks were reported from near Ramsgill, Wakefield, Sheffield, parts of Wharfedale, Bretton Park, Shadwell. So numerous was the species around Barnoldswick that A.P. asked if it was a record year; and E.B.B. found the species in larger flocks at Cliffe in late October than he had known before.

A Fieldfare ringed Djura, Dalarna, Sweden, on July 1st, 1949, as a nestling, was recovered at Dunford Bridge on January 24th, 1950 (E.P.L. in *British Birds*).

174. MISTLE-THRUSH.—Occurred at Spurn on April 12th and 14th; and on August 13th, September 15th and 19th. On October 12th there was one with migrating Song-Thrushes on Filey cliff-top. Near Wakefield *c.* 40 on September 5th (E.G.); and near Esholt *c.* 100 that flew from a copse on September 19th, were noteworthy.

A Mistle-Thrush ringed by Wharfedale N.S. as a nestling on April 10th, 1952, was recovered at Shackleford, Surrey, on November 30th, 1952.

175/7. SONG-THRUSH.—Spurn ringing recoveries:

Ringed July 2nd, 1949; near Doncaster, March 4th, 1952.

Ringed October 15th, 1951; near Libourne (Gironde), France, February 29th, 1952.

Ringed August 30th, 1952; re-caught at Gibraltar Point on September 5th, 1952.

Ringed October 3rd, 1951; in Landes Dept. of France, March 25th, 1952.

Odd birds were present at Spurn on most days from April 4th to May 10th. After June a bird or two was usually present, with the main passage in mid-October (*c.* 150 on October 18th, *c.* 50 October 19th, *c.* 20 October 20th); and fewer recorded on all other days. A bird I ringed at Masham on August 3rd, 1952, was at Bray, Co. Wicklow on December 15th, 1952.

J. Hyatt saw *c.* 10 in rough cover on Boulby cliffs on October 26th, which by behaviour and plumage he judged to be ' continental.'

178/9. REDWING.—Great numbers roosted at Winn Moor with Fieldfares on January 26th (*c.* 5,000 of both species). The roost was much reduced on February 8th, but 500-600 came in; and on the 23rd *c.* 1,500 (J.R.G.). The last spring record occurred at Spurn on May 13th; but a Redwing was caught and ringed on June 15th (R.B., A.C.H.). Two at Spurn on September 27th were followed by *c.* 100 on the 29th, after which birds became fewer until October 18th when *c.* 200 migrating south were recorded with *c.* 100 on the 19th. After fewer birds for a few days, numbers rose again to *c.* 100 on the 26th. There was a bird on the S. Gare breakwater on October 4th (K. Baldridge); and immigrants came in on the 5th to Carlton-in-Cleveland (J. Hyatt). Inland, birds occurred—four on September 30th at Ossett (G.C.); two at Goldsborough on October 4th and *c.* 30 at Ripley (J.R.M.); *c.* 30 at Chevet Park on October 5th (E.G.). Three passed over Apperley Bridge on October 9th (D.B.I.). By the middle of October good flocks were noted at many places. On October 21st there were large numbers on the South Gare, Teesmouth (J.P.U.).

182. RING-OUSEL.—March 26th on Bowes Moor was the earliest record. Two were at Spurn on April 26th. In autumn after an odd bird on October 3rd, 20 appeared on October 12th as a flock at the Point (E. R. Parrinder). There was one on the S. Gare breakwater on October 4th (K. Baldridge). In most breeding areas birds were normal.

184. BLACKBIRD.—Between July 5th and September 30th I ringed 80 Blackbirds in my garden. Of the 70 ringed in the same period of 1951 one ringed August at Drogheda, Eire, in March 1952. One ringed Masham on August 27th, 1952, was

near Roscommon, Eire, on January 25th, 1953. The more interesting of the Spurn-ringed recoveries have been:

Ringed November 4th, 1950; Wexford, Eire, on February 23rd, 1952.
Ringed November 9th, 1949; near Risor, S. Norway, March 28th, 1952.
Ringed October 13th, 1951; near Bremen, Germany, April 3rd, 1952.
Ringed August 19th, 1951; near Grimsby, April 11th, 1952.
Ringed June 30th, 1951; caught at Gibraltar Point, June 27th, 1952.
Ringed November 12th, 1952; Barrow-in-Furness, January 18th, 1953.
Ringed October 14th, 1952; Cloyne, Co. Cork, January 10th, 1953.

A juvenile seen catching minnows in shallow water at Goldsborough Dam on June 29th, swallowed eleven in fifteen minutes without preparing them; an adult Song-Thrush caught two and bashed them on a wall before swallowing (J.R.M.). Parties of *c.* 20 at Coxley on October 13th, and 30-40 on October 20th; and *c.* 40 at Bretton on October 21st were almost all adult males (E.G.). Whilst Spurn was not watched in March when some Blackbirds usually pass, movement was noticed in April and early May; after which numbers recorded decreased and did not take up again until early October, after which peak dates were October 7th (*c.* 20), October 10th (*c.* 50), October 19th (*c.* 75), November 2nd and 3rd (*c.* 70); and passage continued after the last recorded date (November 9th, *c.* 30). One was heard passing over Leeds at 9 p.m. on November 13th (K.G.S.).

186/7. Wheatear.—The earliest occurred on March 8th at Dowley Gap F. Beds, Shipley (D.V., W.B., S.L.), which was the date of the previous earliest record in recent years. Six seen on ploughed land between Wakefield and Huddersfield on April 28th were considered to be Greenlanders (E.G.). Passage at Spurn from April 5th (10) continued until late May. From July 22nd, birds were noted at Spurn almost daily until early October with maxima on August 24th, and September 10th to 19th; and after twelve days with none, two occured on October 26th. Greenland Wheatears were recorded at Spurn by measurement on May 15th, and September 10th, 12th, and 13th.

197. Whinchat.—April 24th at Bottomboat (E.G.) was the date of the first noted. Four at Spurn on April 27th were followed by odd birds almost daily until May 18th. A bird occurred at Spurn on August 1st and from August 22nd records were daily until September 18th, with maxima of 20 on August 24th and 28th. The last occurred on October 12th.

198/200. Stonechat.—Occurrences were: Spurn, three on January 5th, and one on May 9th; at Marishes, Thornton-le-Dale a cock on February 16th; a pair feeding young on June 15th in the Gouthwaite area (A.F.); at Barton one on May 12th (J.P.U.); a female at Eldwick on October 14th, where and about which date S. Longbottom has noted the species in 14 of the past 32 years; a female at Wintersett on December 14th (J.C.). Odd birds occurred at Spurn on many dates from September 27th (two) to October 26th (four on the 5th).

201. Redstart.—First noted, a male in Haw Park, Walton, on April 10th (A.C.L.); and one at Bottomboat (E.G.). Nests of this species on the ground under bracken or other cover are found occasionally; one that occurred near Bradfield was domed (J.C.S.E.); and one seen by A.P. in the Skipton area lay under turf turned over by the Forestry Commission. Passage at Spurn occurred from April 10th to 17th and April 22nd to May 3rd; in autumn from August 21st, with the main passage from September 10th (*c.* 50) to 15th; and after a period of only few birds, numbers came again from September 30th to October 5th. The last occurred on October 20th.

202. Black Redstart.—A bird about Whinmoor Gardens, Leeds, on April 6th and 10th was probably a male in incomplete plumage (J.R.G.). A male occurred at Mytholmroyd on October 27th (A.M., W.G.). Male Black Redstarts occurred again in the centre of Hull in May, singing in the Market Place and near the Railway Station, as has happened since 1949 without proof of breeding. At Spurn a bird occurred on April 21st; and two on October 15th to 20th, three from the 21st to 23rd, and single birds to the 26th.

203. Nightgale.—First heard to sing on May 11th in the Kippax area, and a nest was found on May 25th; in which the five eggs hatched on June 8th (K.D.). Birds also sang in May in the Kirby Moorside area from the 4th (R.M.G., R.W.C.), in the Wass area (E.W.T., N.M.H.), and two in the Roche Abbey area (R.B., H.H.). In South Yorkshire, G. E. Hyde only heard one.

205/6. Bluethroat.—A bird was ringed at Spurn on September 15th.

207/8. Robin.—A juvenile caught at Spurn on June 28th was the first ever recorded there with a speckled breast. A juvenile I ringed at Masham on July 12th had acquired full adult plumage when recaptured on August 13th save for the buff tips to the coverts, etc. A bird retrapped at High Royd on September 18th, 1952, had been ringed four years previously (G.R.E.). A bird was rescued from the Hartley Bank Pit bottom at Horbury on September 1st, at a depth of 30 yards; it flew away after a shift below ground.

Ringed Avoch (Ross.), on March 13th, 1950; Hellifield, March 10th, 1952.

Ringed Burley-in-Wharfedale by V. Huddlestone on April 28th, 1951; Conisborough, March 23rd, 1952.

Ringed Spurn, October 3rd, 1951; near Aigrefeuille (Charente Inf.), France, February 10th, 1952.

Ringed Spurn, October 13th, 1951; near Bourg (Gironde), France, December 17th, 1951.

Ringed Spurn, October 1st, 1951; San Luis, Minorca, December 20th, 1951.

Odd birds were at Spurn from April 6th to 20th, and one on the 26th. From September 7th, one or two were usually present with maxima *c.* 50 on October 3rd, and *c.* 40 on October 19th.

210/12. Hedge-Sparrow.—Up to six present at Spurn on days in April, but only odd birds from May 1st. Numbers increased in mid-September (*c.* 20 on the 19th), and an average of ten daily were recorded to the end of October.

213/16. Wren.—Up to four recorded at Spurn on eight days in April. Usually present from September 17th with *c.*15 as maximum on October 10th.

218. Dipper.—A. Pilkington found a nest sited *c.* 20 feet up on the trunk of an elm growing *c.* 25 yards away from the river in Bolton Woods; and one 8 feet up on a tree trunk at Gisburn sited *c.* 20 yards away from the river. During the frost in early December, when the Camm Fell beck was iced over, a Dipper was seen several times to disappear through holes in the ice and emerge at a distance down or up-stream as the case might be.

220. Swallow.—The species was first recorded at Austwick on April 8th (C.A.C.); and on the 9th at Wintersett (J.C.), Ossett and Horbury Bridge (G.C.), Farnley (D.B.I.), and Haxby (F.J.). Near Huddersfield, E. C. J. Swabey noted flies being eaten on the ground. Big assemblies include *c.* 500 at Gouthwaite on August 3rd (A.F.G.W.); *c.* 400 passing south-east at Horbury S.F. on August 26th; *c.* 600 at Swillington Ing on September 17th (J.R.G.), and *c.* 300 on September 21st (G.C., E.G., J.C.).

At Spurn, Swallows appeared on April 11th and were always present thereafter. The heaviest Spring passage took place from May 1st to 13th and the bulk of it was southward. The heaviest traffic of autumn occurred from August 22nd to 26th. On the 25th during four hours, *c.* 10,000 birds were estimated to pass, most of which passed up the Humber and only a few across to Lincolnshire *via* the Point. The last Swallow occurred at Spurn on October 28th; at Gouthwaite on October 26th a juvenile (A.F.G.W.); at Newby Wiske on October 26th (J.P.U.).

222. House-Martin.—First noted on April 13th in the Vale of Mowbray (J.P.U.). H. Hodgson estimated over 3,000 birds to be congregated over the Calder on August 10th; when rain cleared at 4 p.m. and on a mile and a half of river the air was dense with flies—60 per cent. were House-Martins, 30 per cent. Swifts, and 5 per cent. each of Swallows and Sand-Martins. One pair were still feeding young in a nest at Kilnsey Crag on August 26th (I.G.B.); and the last of a brood left a nest at Burley on October 20th (A.E.P.). At Carlton-in-Cleveland a bird occurred on October 25th (J.H.).

At Spurn, House-Martins first appeared on May 1st. Passage south was noted on May 11th and 12th, and *c.* 50 on June 2nd. Maxima in a day in autumn were noted on August 29th (*c.* 50) and on September 23rd (*c.* 50); and a few birds were seen from October 25th to 27th.

223. Sand-Martin.—The first was seen on the Lower Swale on April 5th (J.P.U.); and the next at Knaresborough on April 6th (J. Rathmell). Congregations occurred at Swillington Ing—*c.* 700 which came in from north-east on July 27th (G.C., E.G., A.F.); *c.* 300 on August 4th (C.N.), and 9th (I.G.B.); *c.* 200 on September 7th; *c.* 1,000 on September 14th (G.C., E.G.); and large numbers on September 13th included a cream-coloured bird which appeared to be very slightly larger (P. G. R. Barbier). *Circa* 400 were there on September 20th (C.N.). There was strong passage at Horbury (*c.* 300) on August 28th (G.C.).

A white or cream bird spent the season with a colony by the Wiske near Yafforth, ' I do not think it ever paired ' (J.P.U.).

At Spurn four appeared on April 11th; and again birds passed mainly southward in spring, and in autumn, when the main passage occurred at intervals in August (maximum *c.* 100 August 31st). Twelve passed north on September 4th. The last appeared on October 7th.

225. Swift.—More than usual arrived in April: April 23rd, Batley (H.H.); April 26th, Haxby (F.J.), April 29th, Burley (E.S.S.), April 30th, Shadwell (J.R.G.), Skipton (A.T.), Knaresborough (H.J.), Keighley (C.D.R.), and Ossett (J.C.). On May 11th with a south-west wind, *c.* 300 hawked about Knostrop S.F. (A. Lee). There were *c.* 125 over Scargill Reservoir on June 14th (A.F.G.W.). On May 12th *c.* 50 flew W-N-W—along the Aire Gap; and on June 10th *c.* 150 passed W-N-W against a north-west wind at Apperley Bridge (R.F.D.). *Circa* 100 passed south-west at Horbury Bridge on July 16th (G.C.). A party of *c.* 100 birds on August 4th, hawking at Bingley at heights varying from near to ground level to *c.* 100 feet, produced a column formation that moved slowly down Airedale (J.K.F.). Two occurred at Hull on September 28th (K.F.). At Spurn a bird flew south on April 30th. The only very considerable movement took place on June 28th when *c.* 2,000 birds moved south. Last seen one on September 4th.

227. Nightjar.—Bred near Wakefield (J.C.), Thorne (W.B.), Bingley (J.C.L.), Esholt (J.B.N., J.C.L.), Hatfield (G.E.H.), and Strensall (E.W.T.). Still occur at Stainborough (C. E. Burton). A bird was found dead on the road near Kirby Wiske on July 2nd (J.P.U.), one was hit by a car at Strensall, and one brought in by a cat at Thorpe Arch. R. Slater flushed a bird at Spurn on September 24th.

232. Hoopoe.—A bird about the garden of Mr. G. N. Jackson at Burley-in-Wharfedale from August 9th to 12th spent most of its time on the lawn (W.F.F.). On September 9th at Spurn, after being seen several times in the Chalk Bank area before breakfast by C. Clarke, R. F. Dickens and D. A. Rushforth, and also out over the Humber, using its rounded wings, a Hoopoe was driven towards the wire dump trap, but passed outside at *c.* 11 a.m. A little over two hours later, at the end of a fruitless drive, the bird was found under the wire and duly ringed and inspected. On September 23rd, about 11-30 a.m., after A. R. Summerfield and I had decided to retire from the contest with the wind and take shelter on the seaward side of the dunes, we found a Hoopoe had done the same thing. The rest of the party were summoned, and the bird watched at leisure as it probed the sand under the clumps of saltwort. A. J. Wallis saw it eat a hairy caterpillar. When we returned southward after lunch the bird was in the same area.

234. Kingfisher.—D. Buffey saw one at the pools on the Humber shore near Kilnsea on September 2nd. The species occurred in Hull on December 14th (East Park Lake), and in a garden on the 20th whither a cat had brought it (G.H.A.).

235. Green Woodpecker.—The first to be recorded at Spurn occurred on October 17th (E.R.P., etc.). A bird that flew out on to a moor partly snow-covered in mid-December was the first J. R. Scott had seen on the Baldersdale moors in winter. Are visits to a garden for bread near Huddersfield by a Green Woodpecker evidence of scarcity of insect-infected timber in the area ? (E.C.J.S.).

236/7. Great Spotted Woodpecker.—One at Spurn on September 30th was ringed, and another occurred on November 1st. From the measurements taken of the captured bird which were intermediate, determination of the race did not seem possible. A bird ringed in Farnley Park on June 12th, 1951, was at Lofthouse, Upper Nidderdale, on May 6th, 1952 (D.B.I.).

238. Lesser Spotted Woodpecker.—Nested in Harewood Park (J. Veuvelle, per A.F.G.W.); and in Duncombe Park (A.G.). Noted in the breeding season near Masham; at Roche Abbey (A.C.H., F.N.); Bretton Park (E.G., J.C.); Thornton Dale (R.M.G.); and near Carlton-in-Cleveland (J.H.); and at Esholt on December 4th (J.B.N.); and near Skipton on November 16th (C.N.).

239. Wryneck.—One at Spurn on September 10th (ringed), and on the 13th (R.F.D.).

240. Cuckoo.—Seen and heard at Bolton Abbey on April 5th (C.F.T.); after which the next were recorded on April 18th near Wakefield (E.G.), near Halifax (B.M.) and in Denton Wood, Ilkley (D.B.I.). Meadow-Pipits were feeding a flying juvenile in Cotterdale on August 23rd (J.P.U., R.C.). Although heard by everyone at Kilnsea on April 29th, it was not recorded at Spurn until the 30th, after which it was noted daily until August 18th; the last occurred on September 3rd.

249. Little Owl.—A bird ringed by Wharfedale N.S. on June 4th, 1951, was near Doncaster on April 16th, 1952. A nest near Sleights on June 24th held two young and the half-eaten remains of a third (A.B.W.).

250. Long-eared Owl.—One ringed Örebro, Sweden, on May 13th, 1950, was at Boroughbridge in March 1951 (E.P.L.). Two were in a hawthorn brake at Ganton on August 4th (A.J.W.). Evidently bred near Keighley, for a young bird was found at the foot of a conifer on May 22nd and taken to the museum. A bird was reported to P. J. Stead by N. Harwood in an area (N.R.) where the species bred before woods were felled. Occurred at Spurn on April 5th and September 24th. On September 24th a bird was seen on the cliff-top at Filey where it lived away from trees until October 18th (A.J.W.).

251. Short-eared Owl.—Two nests were found (seven young reared) and probably a third pair nested in the Bowland area, where the species occurs at all times, and six were seen on September 9th (A.P.). Reported generally rather less frequently than usual; but occurred from early August at Gouthwaite, and near Ilkley, and at Teesmouth on September 13th (K. Baldridge); and at Millington (E.R.) on July 3rd (W.A.B.). Odd birds were recorded on various dates at Spurn in July and early August; and in early September near the Beacon. Three birds were flushed from *spatina* grass on September 14th near Patrington Haven (J.M.L., F.E.K.). A bird flew into the headlights of a car on the Spurn peninsula in early October and died about a week later.

253. Tawny Owl.—A nest at Denton Park on April 27th held six half-grown rats and a wren. A nest at Rawdon on May 7th held the remains of an adult Jackdaw (D.B.I.).

254. Barn Owl.—A bird ringed at Cawthorne by M. Barras-Smith on August 11th, 1951, was at Ruddington, Notts., on December 3rd, 1951. In a nest near Addingham there were five eggs on May 24th, one egg and three young on July 2nd, and the young flew strongly on August 12th (E.D.R.). Birds were hunting by daylight at Esholt on August 14th, and at Swillington on September 17th—presumptive evidence of hungry young in these areas (J.B.N.). Bred in the Thorne area (W. Bunting). A bird found dead at Spurn on September 2nd had died of coronary thrombosis (A. Hazelwood). One occurred at Spurn on October 26th.

259. Peregrine Falcon.—In the north-west, two pairs produced eggs all of which vanished. A late report for 1951 shows that three young were reared at a second attempt. J. M. Laws saw one take a Greenshank in flight on September 19th at Cherry Cob. One occurred near Kilnsea Beacon on August 31st. Peregrines were seen on various dates—near Flamborough, Gristhorpe Bay, Gouthwaite, Elland, Bowes, Cotherstone, and Swillington Ing.

262. Merlin.—There are several reports of breeding about which I prefer not to be precise; and of birds seen near Pateley Bridge (R.F.D.), Thornton Moor near Bradford (C.N.), Grassington Moor (C.N.), and Ossett Spa S.F. on December 21st (E.G.) Occurred at Spurn on April 27th, and odd birds at intervals in September and October. One occurred at Wassand on January 6th (F.E.C., H.O.B.).

263. Kestrel.—A bird ringed at Spurn on August 22nd, 1951, was at Wisbech, Cambs., on October 15th, 1951. Occurred at Spurn throughout the year, but passage was less numerically noticeable than usual, seven on August 13th, six on September 7th, and five on November 3rd were maxima noted on single days. One bird was so intent on trying to take a small bird from a Potter trap that it allowed itself to be picked up and ringed.

269. Common Buzzard.—A pair reared four young, and another pair were robbed of eggs in the north-west (H.W.B.). Buzzards have been noted at Romaldkirk on September 10th (A. P. Coote); and at a number of places south and west thereof; and over lower ground near Haxby on September 14th, October 19th, and November 15th (F.J.). The Rough-legged Buzzard has not been reported.

A Common Buzzard ringed in Cumberland on June 18th, 1950, was at Ingleton on October 3rd, 1951.

271. Marsh Harrier.—A Harrier believed to be of this species occurred at Spurn on May 13th (A.J.W.). One at Swillington Ing on May 4th showed chocolate rufous plumage, darker primaries and yellow-buff head as it was mobbed by Lapwings and Redshanks (K.D.). One flew high near Temple Newsam on October 12th (I.M., B.M.).

272. Montagu's Harrier.—A male was mobbed by Curlews near Ilkley on May 24th (D.B.I.). Four young were ringed in the North Riding from a clutch of

five eggs, and were seen in flight in August. A male was seen quartering the ground a few miles from Kirby Moorside on October 17th (E.W.T.), rather a late date. One occurred at Spurn on August 4th; and one on September 11th (R.F.D.) was probably of this species.

273. Hen Harrier.—A bird occurred in Rosedale on February 24th (H.O.B.). November 28th at Balderhead, near Wemmergill (J.P.U.), and November 29th at Gouthwaite (H. Jowsey) when a bird rose from the marshes; and October 30th along Sutton Bank are autumnal dates. It is rather curious that not one was recorded in the Spurn log for 1952.

274. Pallid Harrier.—A Harrier shot, one of two seen, at Hutton Cranswick, near Driffield, on October 2nd was brought by Mr. F. Wood of Sproatley to the Mortimer Museum, Hull, and passed to Messrs. Gerrard (London) for preservation. It was identified as a Pallid Harrier (*Circus macrourus*) at the British Museum (Natural History) by Mr. J. D. Macdonald (J. B. Fay, G.H.A.). The specimen will go to the Hull Museum. This was an addition to the county list; but under *Montagu's Harrier*, Nelson describes distinctive features of the Pallid Harrier wing formula, as being possessed by a bird obtained by M. Bailey near Flamborough in 1896, which bird was also doubtless of this species.

277. Sparrow-Hawk.—A cock bird made several passes at a small bat near Ellerburn on the early evening of October 23rd. The bat easily eluded the attacks before rising high into the air and flying across the dale (R.M.G.). Odd birds occurred at Spurn from April 13th to 23rd, on May 12th, and on a few days from August 17th, at intervals to October 26th.

284. Osprey.—[On January 13th, Rev. J. L. Folkald at Sewerby heard something flapping and tapping at his window at 3-30 p.m., which proved to be a large, bedraggled bird. It flew up into some tall trees and he saw it no more; but from the glimpse he got of its head and bill he thought it to be an Osprey.] An Osprey occurred in the Esk Valley from May 14th to 17th and was seen by C. E. A. Burnham and G. Wilson on several occasions, perched, in the air, splashing into the river, and eating a fish held in its talons. G. Wilson had seen an Osprey about the same area on October 1st, 1947, and on May 13th, 1950; and C.E.A.B. considers it likely that the same bird uses the quiet reaches of the Esk on its migration.

289. Heron.—Occupied nests in 1952 were—Gargrave 24 (W.F.F.), Healaugh 18 (W.B.), Harewood 12 (W. Busfield), Scampston 10 (R.M.G.), Sleningford 7 (R.C.), Whixley 3 (R.C.), Wassand 29 (F.E.C. and B.S.), Ripley 1 (A.F.G.W.), Gilling 3 (O.J.L.). Ashville College boys watched a Heron put its head down a rabbit-hole, and other birds were standing outside other holes; bodies of rabbits with their 'innards' pulled out lay around. Eight was the maximum noted in autumn at Gouthwaite, rather fewer than in some years. Birds occurred at Spurn on June 2nd, August 11th, two on August 17th, one August 22nd and 23rd; and in the Beacon area on August 18th to 20th, and two on August 31st. Two at Filey on August 30th flew south at dusk about 200 yards out to sea from the Brigg end. Were these birds from Hornsea, or elsewhere in England, or from abroad? In 1950 a Heron at Mexborough, S. Yorkshire, on August 14th, had been ringed on May 22nd of that year in the Isle of Man!

297. Bittern.—Has occurred each season since 1945 near Brough, E. Yorks. (Dr. A. Mackenzie). A bird was put up out of a swamp near Helmsley on September 29th (A.G.). A bird frequented the canal near Holme-on-Spalding Moor for a fortnight in late October (Hon. J. Locke). Occurred at Wassand in early September and November (B.S.); and on October 5th (F.E.K.), December 6th (H.O.B., F.E.C.), and 21st (F.E.C.).

300. Whooper Swan.—Occurred in the early months on waters at Swillington, Stocks, Lindley Wood, Swinsty, Fewston, Semerwater, Coniston Cold, Malham, Bottomboat; and one flew over Batley on January 26th (H.H.). Numbers nowhere else approached those at Gouthwaite where the maximum was 20 on January 15th (A.F.G.W.). In autumn up to 16 occurred at Gouthwaite (November 8th and 9th), 10 were at Fewston on November 30th (I.M., V.S.C.); and smaller numbers were recorded at Stocks, Hury and Malham. An adult occurred at Marishes (Vale of Pickering) on November 23rd and 28th (R.M.G.). A bird found alive in Fylingdale on October 9th was kept until the 18th and then released on the Esk at Sleights, and was found dead in Whitby Harbour, on the 26th. The 40 stated in the 1951 report to have occurred at Boynton should have read 20 (F.W.).

301. Bewick's Swan.—Four adults and three young birds occurred at Wintersett Reservoir on November 26th (M. N. Rankin).

302. Mute Swan.—The large number of 37 adults and 11 immatures appeared on Fairburn Flash on December 14th (K.D.). Fourteen on December 27th was the largest number seen at Swillington Ing in the year (K.D.). A brood of ten was reared in Bretton Park; all but one juvenile left in September (E.G.).

303. Grey Lag-Goose.—One at Scargill Reservoir on November 16th (M. Wray, J. Baker) was still there on December 12th (A.F.G.W.). Five came down to flooded grazing-marsh at Thornton Marishes on November 8th. As they spiralled down their blue-grey shoulders were distinct and the self-coloured beaks could be seen (R.M.G.). There were four at Wassand on November 22nd (F. E. Kennington). On October 24th Mr. P. Scott identified one Grey Lag on the Wolds among a large number of Pink-feet. Thirty-six flying up Gouthwaite Reservoir at 3-15 p.m. on December 30th were of this species (R. Smith, A. W. Goodin).

304. White-fronted Goose.—Dr. A. Mackenzie states that up to 70 White-fronts are usually on the upper Humber sands in January and February with the Pink-feet.

307. The Pink-footed Goose, and 'Grey Geese.'—Indeterminate skeins have occurred in the winter months, mainly in smaller flocks than in the following selections from the records. The great majority were most probably Pink-feet, flighting between alternate winter habitats. On February 24th, *c.* 200 flew north-westerly over Guiseley at 5-15 p.m. (D.B.I.); *c.* 300 flew west-north-west up Wharfedale from near Lindley Reservoir on November 30th (C.N.); *c.* 400 flew north-westerly over Ramsgill on December 7th (A.F.G.W.); and *c.* 100 easterly over Northallerton on September 30th (J.P.U.); about 100 flew northerly over the Briscoe Moors on February 25th and more big flocks followed on the next day (J.R.S.). On September 28th, 53 flew south over Fly Flatts Reservoir (C.D.R.). On November 22nd a large flock flew westerly over Haxby (F. J.). On December 22nd, *c.* 80 flew north-west over the Washburn Valley (J.P.B.); and *c.* 100 westward over Riffa House (H.M.). That is as many of such as I can cite.

In the East Riding geese have been normal since E. B. Burstall saw the first on September 21st. There were *c.* 1,000 at Faxfleet on February 2nd (E.C.J.S. and T. Henderson); and *c.* 1,000 flew over North Dalton on November 3rd (W.A.B.). One hundred and thirty-seven flew south at Skirlaugh at 10-15 a.m. on October 4th; half an hour later the same number flew over northward (F.E.K.). Mr. Peter Scott sends the following notes—*c.* 2,000 on the Yorkshire side of the Humber at morning flight, October 23rd. *Circa* 4,000 on the Wolds on October 24th. On the 24th Mr. Scott caught 51 out of *c.* 400 in one Wolds field with his rocket-net; and 97 out of *c.* 350 in the same field on the 25th. Of those caught, one had been ringed in Central Iceland on July 28th, 1951; and another in south-east Scotland on October 8th, 1950. The remaining 146 birds were ringed and released, one of them to be recaptured on The Wash on October 27th. One bird on the Wolds had a white patch on the primaries and primary coverts, and has been reported seen since also on The Wash. We may be sure Mr. Scott looked expertly; but of all these East Riding geese only one could be found that was other than Pink-footed—the Grey Lag-Goose of October 24th.

Odd Pink-feet have occurred at Lindley Reservoir on February 17th (K.D.), near Knaresborough on March 2nd (H.J.); at Fewston from November 14th (C.D.R.) to December 14th (J.K.F.); at Harewood two from December, 1951 to January 16th (D.B.I., D.A.R.); at Bottomboat on April 20th and May 1st and 4th (G.C., E.G., A.F.); and at Gouthwaite on December 7th (A.F.G.W.).

308. Snow-Goose.—Dr. A. Mackenzie reported one among 17 Pink-feet at Blacktoft in February 1952.

311. Barnacle Goose.—Seven birds showed their white faces and black and white wings to W. W. Nicholas at Stainton Dale on November 2nd.

314. Canada Goose.—Bred at Gouthwaite Reservoir (two broods, A.P.); Ripley (three, A.F.G.W.); Bretton Park (brood of 11 on June 4th, E.G.); Walton Hall (M.N.R.); Fewston; Swinton Park, Ilton and Roundhill Reservoirs, Harewood Park, etc. Numbers were larger in autumn at Gouthwaite than ever with 172 as maximum on November 16th (A.F.G.W., A.P.), no doubt built up from several areas. Fifty at Harewood in flight on December 21st appeared to be headed for Eccup; and there were 43 on the same day at Ripley, and 42 at Nostell Priory. The maximum for Bretton Park was reached on June 21st with 129 including 34

goslings. About 55 flew westward over Shadwell, Leeds, at 9-30 a.m. on October 30th (J.R.G.).

315. Sheld-Duck.—Up to 15 observed daily at Spurn in April and May. R. A. H. Coombes came on July 21st to watch Sheld-Duck migration—29 passed from the Humber far to sea at 9-29 p.m., flying fast at *c.* 150 feet. On the 22nd, 31 passed out to sea at 9-6 p.m., and seven at 9-33 p.m., none passed on the 23rd. Nineteen passed east on August 23rd. Only very few birds occurred on a few days in autumn.

Inland, Sheld-ducks occurred on days in January to March at Gouthwaite (and one on August 22nd) (J.R.); Eccup, High Royd, Wintersett, and Swillington Ing where birds were usually present until September 14th with two pairs there in May. A bird at Bottomboat on May 1st had probably derived from Swillington. There were five at Blackmoorfoot Reservoir on November 1st after the heavy gales (J.C.S.E.). Two birds at Teesmouth on August 24th were in partial moult (C.N.).

317. Mallard.—Ringed Noord Holland, August 20th, 1949; Thornton-le-Dale, January 29th, 1952. A pair at Gouthwaite paired and mated on October 21st (A.P.). On September 17th, only two out of a sample hundred at Swillington were through the eclipse. On September 18th at Gouthwaite six out of 40 were through the eclipse. On September 19th at Roundhay Park *all* Mallard were through the eclipse, perhaps as the result of artificial feeding (K.G.S., J.R.G.). Winter counts of Mallard at a number of inland waters show Swillington Ing, and Eccup Reservoir as those used by the largest numbers, as expected. *Circa* 2,000 were huddled on the ice at Hornsea Mere on December 6th (F.E.C.).

318. Gadwall.—Two males at Swillington Ing on September 17th showed their white specula with black bar before (J.R.G.). A female occurred on a pool near Filey Brigg on October 15th and 16th (W.A.B.).

319. Teal.—Out of five young Teal ringed by R. F. Dickens on Malham Moor on June 29th four had been recovered before the year end—at Bewholme, near Driffield, in August; at Bootle, Cumberland, on October 19th; in Co. Antrim on November 13th; and in Co. Cork on August 17th. A drake on the Humber foreshore at Skeffling in mid-December had been ringed near Colchester on November 29th, 1952. The estimated number at Swillington Ing on November 9th was *c.* 1,000; and *c.* 300 at Hornsea Mere on December 21st and 31st (F.E.C.).

322. Garganey.—The smooth, cream, sans-green eggs (nine and one laid later), and the down with white centres and tips, identified a nest I found in the East Riding on May 25th. The nest was seen subsequently with hatched egg-shells. Breeding was also reported at two places in the West Riding. A pair was seen at Bottomboat on June 22nd (A.F., E.G.), and single males at Swillington Ing on May 7th and June 2nd, at Stanley S.F. on July 20th; and at Hornsea Mere. There were three males near Cowton on a marshy pool on May 18th (K. Baldridge).

323. Wigeon.—Occurred in usual numbers on the usual waters. A pair were on Hornsea Mere on June 1st (F.E.K.). A drake at Swillington Ing on August 4th was in partial eclipse (C.N.); and Wharfedale Naturalists saw a party at Gouthwaite on August 4th. The last at Spurn (six) occurred on April 27th, except for one on May 24th. From September there was a very gradual build-up at Spurn to *c.* 80 on October 27th; but from October 31st to the year end numbers fluctuated between 100 and 300.

325. Pintail.—There was a pair at North Cowton on May 18th (K. Baldridge). No more than seven (Swillington, January 11th (J.R.G.) and February 13th (K.D.)) were seen anywhere; but a few occurred in the winter months at Gouthwaite, Ripley, Goldsborough Dam, Swinsty, Fewston, Fairburn, Eccup, and Blackmoorfoot Reservoir (on November 1st after heavy gales, J.C.S.E.); and at Cherry Cob (September 7th and 14th), and at Hornsea Mere; and four over the Wiske on January 27th (J.P.U.).

326. Shoveler.—Probably bred at Gouthwaite; bred at Swillington Ing (A. H. B. Lee), and near Broomfleet (A. Mackenzie), and at Bottomboat (E.G.), and on a marshy tarn in the North Riding (R. Harricks); and elsewhere suspected. Seen in winter and early spring at a dozen waters with maximum numbers at Swillington Ing, *c.* 30 on April 16th (C.N.); and *c.* 50 on September 20th, and *c.* 100 on October 26th and November 9th (K.D.); at Eccup Reservoir, 41 on October 15th (D.A.R.); and up to 17 at Ripley in August (A.F.G.W.). More reports of Shoveler have reached me than ever before.

328. Common Pochard.—Bred at Fairburn, four broods were seen on July 5th

(M.F.M.M.); and at Castle Howard Lake, four or five pairs (E.W.T.). There were *c.* 50 at Hornsea Mere on January 6th (F.E.K.), *c.* 50 at Stocks Reservoir on February 17th (J.K.F.); *c.* 380 at Wintersett on March 2nd; *c.* 86 at Fairburn on November 16th (D.D.); and smaller numbers at Gouthwaite, Ripley, Lindley, and odd birds elsewhere.

330. Tufted Duck.—Bred at Gouthwaite, Copgrove, Bretton Park and elsewhere. Seventy were recorded at Fairburn on April 12th (K.B.); 50 at Swillington Ing on October 26th; and smaller numbers on a number of waters.

331. Scaup-Duck.—Birds were recorded—a female at Gouthwaite on August 17th (A.F.G.W.), and one on September 18th (J.R.G., K.G.S.); one at Esholt on August 28th (J.B.N., R.F.D., J.K.F.); and three drakes with two ducks at Blackmoorfoot after the October gales (J.C.S.E.).

332. Goldeneye.—An adult ringed Torne, Lapland, on June 1st, 1949, was near Tadcaster in February 1950 (E.P.L.). During the year I have notes of Goldeneye from upwards of 25 waters from some 50 people. Among 31 birds at White Holme Reservoir on March 9th were some displaying males (G.R.E.). In spring the species was last reported on April 27th—12 at Gouthwaite (A.F.G.W.), and a pair at Harewood (D.B.I.). The first of autumn appeared at Swillington, a ' brownhead ' on September 7th (J.C., E.G.), and 20th (J.R.G.). More normal birds were two at Lindley Wood (J.C.S.) and Gouthwaite (A.P.), both on October 11th. Severe weather prevailed from mid-November. On November 16th, 24 Goldeneyes appeared at White Holme Reservoir (B.W.), and 23 at Fairburn Flash (K.D.). On November 23rd there were 49 at Withens Reservoir (B.W.); abnormal numbers for any Yorkshire waters and probably connected with the early severity. More adult males were seen generally in November than is usual. At Hornsea Mere *c.* 26 on February 24th were balanced by *c.* 25 on December 21st (F.E.K.). A ' brownhead ' at Blackmoorfoot Reservoir on June 21st (J.C.) was very unusual.

334. Long-tailed Duck.—Occurred at Filey: January 20th and 27th a male and female, two ducks on March 9th, and on November 9th, and a drake on December 27th (A.J.W.); and at Spurn a drake on November 1st (K.F., A.G.) etc., and also a duck (K.F.).

337. Common Eider.—A drake occurred at Spurn on May 9th; and birds at Filey, three on November 9th and December 27th, and one November 23rd; at Teesmouth six on December 26th (A.B., K.B.).

339. Common Scoter.—Occurred frequently at Spurn with *c.* 500 on July 26th in a ' raft ' (R.F.D.); 16 at Filey on July 20th (A.J.W.); and 40-50 at Bridlington on July 1st (F.W.). Recorded on a number of waters inland on various dates but mainly from July to September, with four at Eccup on January 6th (R.F.D.) and four at Soyland on November 16th (B.W.).

340. Velvet Scoter.—Seen at Spurn on August 15th (five) (G.R.E.); and a small party at Filey on August 31st, *c.* six on November 3rd, and four on November 9th (A.J.W.). Three were at Teesmouth on September 9th and four on October 11th (D.R.S.). A duck was noted at Swillington Ing on November 9th (K.D.).

342. Goosander.—Recorded on 18 waters, with maxima at Stocks, 62 on February 26th (A.P.) and 54 on March 30th (R.F.D.). There were 37 at Eccup on March 16th (A.H.B.L.); and 16 at Malham on February 24th and March 4th (P.F.H.), and 24 at Hornsea Mere on March 16th (F.E.K.). The last pair seen were at Eccup on April 27th (D.B.I.); and the first of autumn were ' redheads,' one at Gouthwaite on October 11th (H.J.); and four at Eccup on the 12th (C.N.).

343. Red-breasted Merganser.—A duck flew north at Spurn on October 8th (G.R.E.). Occurred at Teesmouth on January 1st (A.B.) and April 11th; and one at Blackmoorfoot Reservoir on September 27th (G. Harrison, per E.C.J.S.).

344. Smew.—Occurred: a drake at Fairburn on February 11th (R.C.); five ducks and a drake at Eccup on February 24th (A.H.B.L.); one Wintersett, January 12th and February 23rd (J.C.); three ducks at Harewood, December 30th (D.B.I.); and at Gouthwaite on various dates at both ends of the year with maximum of four on February 24th (J.R.G., J.M.L.).

346. Cormorant.—Fewer nests were reported in the Gristhorpe colony. C. Nelson estimated fifty at Hunt Cliff. At Boulby, birds bred normally.

348. Shag.—Several seen regularly about the Bempton and Flamborough cliffs, and actions of birds suggest breeding (A.J.W., W.A.B.). A first-year bird walked into a workshop near the river at Wakefield on November 2nd, 1952, and died (J.C.).

349. Gannet.—The little Bempton ' colony ' had its most successful year, three young being reared by as many pairs (A.J.W., H.O.B.).

350. Storm Petrel.—The great ' wreck ' of the following species at the end of October included one or two Storm Petrels. A bird picked up near Bolton Abbey on November 11th, which had been dead for some time, had no fork in its tail (C.F.T.).

351. Leach's Fork-tailed Petrel.—The effects of the series of gales that raged over England in mid and late October upon this species, large numbers of which were driven ashore, were experienced in Yorkshire. The following occurrences are doubtless incomplete.

October 12th: One was seen flying over Eccup Reservoir (C.N., A.H.B.L.); and one on October 19th (S.J.W.); and one was fished from the water dead on October 30th (S.J.W.).

October 13th: One rose at Spurn from the muddy ground in the wire-dump area and flew into the gale (E. R. Parrinder).

October 25th: One picked up on a golf course at Wakefield (J.C.).

October 26th: One found alive at Yarm (died) (W. R. Brown).

October 28th: One found at Hebden Bridge (died) (F.D.).

October 29th: Two birds at Spurn, probably three, flew above the high tide and the *spartina* grass in the Estuary, topping the waves and pattering along between, apparently seeking food (H.G.B., R. and A.C.L.). One was seen on the 30th (R.C.); and one on November 1st and 2nd (S.J.W.). A bird picked up alive in Hull on October 29th was sent by G.H.A. to Spurn where we were unable to get it to take food (died). One found alive at Ripley (died) (A.F.G.W.); and one was found dead near Harrogate (E.W.T.).

October 30th: One dead near Wetherby (G. Dent); and one near Pickering (R.M.G.).

October 31st: One dead near Brighouse (G.R.E., V.S.C.); and one seen flying over the Humber at Stone Creek (P. England).

Thereafter birds were found dead in Bransdale (E.W.T.), at Bolton Abbey (two) (C.F.T.), Hesleton and Arrathorpe (N.M.H.), Sedbergh, near Leeds, Bedale (two), Ingleton, Littleborough (B.W.), near Huddersfield (E.C.J.S.), Skipton (A.T.), and Bridlington (G. J. Brown). Many more must have perished unknown; and the total over England must have reached thousands. All appeared to have come in the westerly gales from the Atlantic.

355. Manx Shearwater.—A ringed bird picked up near Huntington was sent to the Yorkshire Museum; it had been ringed at Skokholm and released experimentally near Cambridge (E.W.T.). A bird flew north past Filey Brigg on July 26th (A.J.W.).

360. Great Shearwater.—A very large Shearwater with dark wings and back and white underparts, flew past off the coast near Spurn in the evening of August 10th. Presently it alighted on and arose from the sea several times; and once plunged from *c.* 10 feet, sending up a shower of spray (G.R.E.).

368. Fulmar.—Several sat in pairs and flew about a quarry a quarter-mile from the sea near Ravenscar in summer; but no eggs were seen. One bird visited and swept round a quarry near Grosmont on June 15th (A.B.W.). The species had returned to the coast near Filey by December 27th (A.J.W.).

370. Great Crested Grebe.—About 50 pairs nested or tried to nest in Yorkshire waters, Fairburn and Hornsea Mere having the most adults and resultant young. A bird has wintered at Malham Tarn (P.F.H.); and there were two in winter plumage at Eccup on October 12th (C.N.).

371. Red-necked Grebe.—A bird at Swillington Ing on February 2nd and 3rd frequently brought small fish to the surface for swallowing. It was only just beginning to assume breeding plumage (I.G.B., K.D.).

373. Slavonian Grebe.—A grebe on a reach of the Swale on January 5th had a straight bill and black cap that did not reach beyond eye level (J.P.U.). A bird at Harewood on January 14th (D.A.R.) was also seen on the 16th by D.B.I., and had gone by the 18th.

374. Black-necked Grebe.—An adult at Swillington Ing on August 5th (K.B.), and 6th (K.D.) still showed much of its breeding dress.

375. Little Grebe.—When Gouthwaite Reservoir was frozen on December 7th one swam under water along the river course. Simultaneous strokes with both feet, and closed wings could be seen (P. Radley, per A.F.G.W.). The species was more numerous generally than since the 1946/7 frost.

376. Great Northern Diver.—The species was seen at Scarborough on

February 27th (G.R.E., W. R. Grist); and at Teesmouth one fed close inshore on December 26th (A.B.).

377. White-billed Northern Diver.—For A. J. Wallis's details of a bird found oiled and dead at Scarborough on January 30th; and for A. B. Walker's details of a bird found alive at Sandsend on February 10th, see *The Naturalist* for July 1952 and *British Birds* for December 1952.

378. Black-throated Diver.—A bird was found badly oiled near Scarborough in early February (A.J.W.; and see *The Naturalist,* July 1952); and one dead at Hornsea on November 30th (M.K.T.). A bird reported to A. Pilkington as present on Stocks Reservoir on November 29th was of this species from descriptions of size and plumage. In the white of the throat was a small dark patch, and small dusky patches appeared at the sides of the base of the neck.

379. Red-throated Diver.—One at Gouthwaite was still in breeding plumage on September 21st (A.F.G.W., J.R.M.). One at Hornsea on April 24th showed no trace of summer plumage (J.M.L.). A ' diver ' occurred at Filey as early as August 31st, and of 12 seen in autumn on various dates only one was identified as a Red-throat with certainty (A.J.W.). At Spurn six Red-throats occurred on October 11th and a few on other days; but nine divers on October 31st were not identified.

380. Wood Pigeon.—In the early morning of October 28th, *c.* 150 Wood Pigeons in a flock came in to Spurn at a good height from sea, followed by another flock of similar size; the two flocks merged and passed southward (G.H.A., R.C.). This was interesting in view of some recently expressed doubts concerning migration by this species.

383. Turtle Dove.—First recorded inland at Melsonby on May 2nd (J.P.U.). One was shot at Raby in early October (A. P. Coote). Occurred at Spurn on April 29th and May 14th. Increasing about Nunthorpe (G.A.E.).

386. Bar-tailed Godwit.—Present at Spurn until May 13th, and from July 26th, with *c.* 100 on November 3rd as maximum. There were *c.* 400 at Teesmouth in January (K.B.). Occurred at Gouthwaite, three on August 2nd (E. G. Campbell), and one on the 3rd (A.F.G.W.), and at Swillington Ing, four on September 19th (H.W.).

387. Black-tailed Godwit.—Occurred: two, Bottomboat on July 12th (G.C.); one Marley, Bingley, on August 10th (J.K.F.); one Teesmouth on August 24th (C.N.); seven at Wintersett on August 28th still in summer plumage (J.C.); and one at Cherry Cob on September 4th (J.M.L., H.O.B.).

388. Curlew.—Occurred throughout the year at Gouthwaite, with 35 on January 15th (A.P.). Major flocks have been recorded at Stocks Reservoir, *c.* 1,300 on August 14th (K.G.S.); *c.* 300 on Bowes Moor on August 20th (P.Y.); *c.* 500 at Teesmouth on August 24th (C.N.); and *c.* 500 at Cherry Cob on August 31st (G.H.A.).

Ringed near Sedbergh by J. M. B. King, June 25th, 1951; recovered Co. Cork in October 1951.

Ringed Gisburn by J. J. Boon, June 2nd, 1951; recovered St. Renan (Finistère), France, November 7th, 1951.

Ringed Norway (58° 41′ N.; 5° 41′ E.) July 4th, 1951; Reed's Island, Humber, August 20th, 1951.

Twelve were still on moors near Scargill on November 7th, 1952 (J.P.U.).

389. Whimbrel.—Noted four calling at Teesmouth on August 24th (C.N.); three calling passed over Harrogate on August 26th (A.F.G.W.); and three at Redcar on September 7th (P.A.R.). Passed at Spurn from April 28th to May 24th, and from July 22nd to September 28th, with maximum of 25 on August 6th and 25th. A Whimbrel called at Gouthwaite and was comparable with four Curlews also present on January 19th (I.G.B.).

393. Woodcock.—' Roding ' at Malham was not continuous, but was noted on July 8th several times (P.F.H.).

Occurred at Spurn on April 18th, October 1st, 12th to 14th, 19th to 21st, October 26th and on November 3rd.

398. Jack Snipe.—Recorded at Ossett Spa S.F. in the early months and in late autumn (E.G., G.C.); one at Riffa, September 8th to 12th (H.M.); two rose from a stream at Carlton, near Leeds, on December 1st (D.B.I.); one shot at Barnoldswick on October 4th (A.P.); one flushed from the Nidd bank near Knaresborough on December 21st (J.R.M.); and at Spurn one on September 20th and on several dates in October (three on the 16th), and one on November 8th (K.F.).

402. Turnstone.—Maximum at Spurn *c.* 100 on August 12th and September 10th. J. C. S. Ellis reported a juvenile at Ingbirchworth in late August.

403. Knot.—From April 4th there were hardly any at Spurn until *c.* 60 on April 25th, and then no more until late July, and very few until *c.* 100 on August 10th, and very few again until November 3rd (*c.* 500), and *c.* 1,000 on the 4th, 8th and 9th; with *c.* 2,500 on December 29th and 30th. At Teesmouth there were *c.* 3,000 on January 1st, *c.* 300 on March 23rd (A.B.), and *c.* 260 on August 24th (C.N.). Birds occurred inland at Wintersett, one on November 1st (J.C.S.E.); and at Swillington Ing two on several dates from September 7th to 21st (J.C., G.C., E.G., J.B.N., K.D.). A bird ringed Jaeren, S. Norway, on September 3rd, 1949, was at Bridlington on February 10th, 1950.

404/5. Dunlin.—Maxima occurred at Spurn on April 11th to 16th (*c.* 1,000 daily); and from August 30th to September 2nd, up to *c.* 2,000 daily. Occurred on many waters inland. Breeding proved in the Yorkshire Pennines (B. Wrightson and K. Baldridge). Fifty-two Gouthwaite on July 20th included 44 in breeding plumage (A.F.G.W.).

A bird ringed Jaeren, S. Norway, October 5th, 1950, was at Goole on November 19th, 1950 (E.P.L.).

406. Curlew-Sandpiper.—Four on September 1st and two on September 30th were recorded for Spurn. J. M. Laws saw one at Cherry Cob on September 16th. Three occurred with 21 Dunlins at Ringstone Edge Reservoir on September 9th (I.G.B.); and at Swillington Ing one with Dunlins on August 20th (J.E.B.), and three on September 19th (H.W.).

407. Little Stint.—Not recorded at Spurn. At Swillington Ing one on August 17th (J.R.G.) and on the 21st (G.R.E., B.M.). At Cherry Cob two on September 14th had increased to six on the 16th (J. M. Laws).

409. Temminck's Stint.—One at Swillington Ing on August 24th with Common and Green Sandpipers showed white outer tail feathers (G.C., E.G., A.F.).

411/12. Pectoral Sandpiper.—A snipe-sized wader with a strange call-note (a double 'clip-clip') was flushed at Spurn on October 10th. Bill shorter but bird larger than Dunlin. Rump dark-centred with white-edged tail. When it alighted at a distance the dark back and breast contrasted sharply with the white underparts (G.R.E.).

415. Purple Sandpiper.—One was watched at Spurn, usually in company of Turnstones, by a number of observers from October 18th to the end of the month. There were four at Teesmouth on September 28th (C.N.). Parties wintered as usual about the rockier parts of the coast about Whitby, Robin Hood's Bay, Filey Brigg and Bridlington.

416. Sanderling.—Maxima at Spurn *c.* 150 on April 29th and *c.* 500 on September 1st. At Teesmouth *c.* 200 were in summer plumage on July 20th (C.N.). Always present on Coatham Sands, maximum in autumn *c.* 100 (K. Baldridge). Occurred at Gouthwaite on July 20th (three), and on August 10th (one) (A.F.G.W.), and at Swillington Ing, one on June 2nd (K.D.).

417. Ruff.—There was a Reeve at Thornton Marishes on March 23rd (R.M.G.); and three birds at Cherry Cob on August 16th had increased to six by the 24th (J.M.L.); and there were six on September 13th (K.F.).

At Swillington Ing birds occurred from August 14th to September 21st with maximum of ten on September 14th (J.B.N., K.D., etc.). Ruffs also occurred at Horbury S.F. and Ossett S.F. on several dates in September (G.C., E.G., C.N., H.H., etc.); and at Fly Flatts Reservoir two on September 7th (C.N.).

421. Common Sandpiper.—First at Ramsgill on April 19th (J. Vauvelle; one at Gouthwaite on August 31st where A.F.G.W. had not seen one since August 9th. A late bird at Esholt on October 15th remained until December 15th (J.B.N.).

423. Wood Sandpiper.—More of this species were reported than ever before, and I am satisfied the following were authentic from details supplied that would occupy too much space if published. Cherry Cob—two on August 10th and one on August 23rd (J.M.L., F.E.K., F.E.C.); and one at Rise Park on August 16th (F.E.K.). Kilnsea ponds—one on August 17th and 23rd (H.O.B., J.M.L., etc.). Swillington Ings—one on August 31st and September 7th (G.C., E.G., A.H.B.L.). Gouthwaite—one on August 3rd and 4th, and two on the 5th (A.F.G.W., W.F.F., H./J.W.). Ringstone Reservoir—one on August 11th and 12th (I.G.B.).

424. Green Sandpiper.—From June 29th this species was reported at many places in all Ridings. On August 17th there were *c.* 30 (G.C., E.G., A.F.) at Swillington Ing; and they were numerous on the 21st (G.R.E., B.M.). A few appear to

have wintered—several on the Swale on January 5th (J.P.U.); and one at Chevet on the 27th (A.C.L.); one in the Staveley-Copgrove area on November 16th (C. Webb), and two on February 24th, and one on other dates up to April 18th (J. Rathmell); one at Swillington Ing on March 4th (I.G.B.); one at Riffa on October 3rd and December 29th (H.M.).

428/30. Redshank.—At Spurn, *c.* 100 on April 5th dwindled to one on May 10th. Autumnal maximum *c.* 200 on October 30th; and *c.* 250-300 at Cherry Cob on September 17th. At Teesmouth there were *c.* 300 on August 24th (C.N.).

431. Spotted Redshank.—One called and gave good views at Bottomboat on April 17th (E.G.). The species was noted at Cherry Cob on August 16th and 21st (J.M.L.); at Spurn on September 2nd, 3rd (two) and 5th; and at Rise on September 7th (F.E.K.).

432. Greenshank.—Occurred from July 6th to October 5th on various dates by numerous reservoirs, flashes, sewage farms, and by the Humber.

435. Ringed Plover.—Present at Spurn always with maximum numbers from August 30th to September 2nd (*c.* 500 on the 1st). Bred at Spurn (*c.* 25 pairs); and by the Ure near Ripon (R. R. Thompson); and at Teesmouth (*c.* five pairs). The usual small parties and odd birds occurred by various inland waters.

438. Little Ringed Plover.—Several pairs attempted to breed, two probably successfully. Four young were seen of one brood, and nests with three and two eggs found.

440/1. Golden Plover.—With Harrogate Stray no longer ploughed Golden Plovers there in winter have dropped to much smaller numbers (A.F.G.W.). Large flocks however occurred near Pool-in-Wharfedale, Farnley Gravel Pits, Winn Moor, Redcar, about Ossett, and at Bottomboat. Sixty near Beckwithshaw on April 20th included 15 with full plumage of northern race, and others in intermediate stage (A.F.G.W.). A flock of *c.* 200 near Redcar on September 7th were sufficiently in breeding dress to suggest the northern race (P. A. Rayfield), as were *c.* 50 on August 16th at Cherry Cob (J.M.L.).

444. Grey Plover.—A bird occurred at Redmires, Sheffield, in a flock of *c.* 150 Golden Plovers (D. R. Wilson). There were *c.* 250 at Teesmouth on January 1st and *c.* 100 on March 23rd (A.B.). The maximum at Spurn occurred on September 5th (*c.* 150).

446. Dotterel.—A. H. B. Lee tells me a trip of six Dotterel were on short heather on Spaunton Moor on May 13th, 1951. A Dotterel showed its breastband clearly among a mixed party of Golden Plovers and Lapwings on Fountain's Fell on September 14th (J.H.I.L. and J.K.F.).

449. Lapwing.—An 'oatmeal-coloured' bird with a black gorget was seen near Marishes (Vale of Pickering) on March 23rd (R.M.G.). Ringed Slaidburn by G. A. Bowden, June 10th, 1951; Camolin, Wexford, February 6th, 1952. Ringed Slaidburn by J. K. Fenton, June 10th, 1951; Kildare, Eire, January 19th, 1952. Ringed Ilkley by Wharfedale N.S., March 26th, 1951; Longhor, Glamorganshire, January 20th, 1952.

452. Oystercatcher.—Bred by rivers in several western inland areas, and one present on the Rye in April (E.W.T.). A bird at Marishes on March 11th was the first R.M.G. had seen in the Thornton Dale district. The Spurn pair were robbed.

462. Black Tern.—On May 11th two occurred at Spurn (W.F.F.), and six at Bottomboat (G.C., E.G., A.F.); and one over Castle Howard Lake on May 19th (R.M.G.), when also there were two at Spurn. Birds occurred at Swillington Ing on several days from September 7th to 14th; at Ossett S.F. on September 3rd and 14th; at Horbury S.F. on September 3rd and 17th; and at Fairburn on August 21st. There were two at Lindley Wood Reservoir on October 18th (J.B.N., J.C.L.). August 27th, and September 1st and 2nd were autumnal dates for Spurn.

467. Sandwich Tern.—Two appeared at Spurn on April 29th, after which the species occurred on a number of days in spring, and on every day from July 26th to September 17th, with odd stragglers as late as October 10th. *Circa* 50 left Teesmouth S-S-W on a course that would take them past the Cleveland Hills on June 26th (D.R.S.).

469/70. Common or Arctic Tern.—First at Spurn on April 27th and passed intermittently in spring in small numbers not always identifiably, but some from May 19th to 24th were definitely Arctic. The later passage in autumn, from August 15th to September 6th were also mainly Arctic. One appeared on September 25th and 20 on October 6th—the last.

As usual a number appeared inland: April 18th, Wintersett (A.C.L.); May 4th, Ripley (A.F.G.W.); May 8th, Bottomboat (E.G.); *hirundines* appeared at Malham on May 16th and 30th (P.F.H.), and one at Gouthwaite on June 2nd (R. W. Millward, J.R.M.). Five at Fewston on July 19th and one at Farnley on August 16th (J.K.F.) and one over Ossett on August 22nd complete the list. A pair of Common Terns bred at Teesmouth (K. Baldridge).

471. Little Tern.—Breeding occurred near Teesmouth; but eggs laid on Coatham Sands were taken. At Spurn from April 19th, upwards of 50 birds came; and were disturbed more than ever before. Eighteen eggs were found in a heap on one day. Perhaps up to ten young birds were reared. Last recorded on August 18th.

474. Sabine's Gull.—A juvenile frequented the outflow of a sewer at Scarborough from October 4th to 12th. At close quarters, the vermiculated grey of the head and back became very noticeable, and in flight the broad ' Vs ' of dark brown were well marked (A.J.W., E.A.W., R.M.G.).

477. Little Gull.—Adults occurred in Scarborough Harbour on February 5th and 8th, and on September 6th and 7th (A.J.W.). On October 10th one flew from the sea to the Humber near the Spurn Chalk Bank (G. R. Edwards, R. W. Crowe).

478. Black-headed Gull.—Ringed birds have been recovered—

Ringed:

By the Aire near Leeds, 6/7/52, as young by J.R.G; Malham Tarn, 13/9/52 (A.P.).
Near Haworth, 24/7/50, as young; on Whernside, early July 1952.
Near Haworth, 1/7/51, as young; Tralee, Co. Cork, 1/10/52.
Slaidburn, 23/6/51, as young; Bridlington, –/2/52.
Swillington Ing, 17/7/51, as young (D.B.I.); Barnes, Surrey, 24/2/52.
Swillington Ing, 11/7/51, as young (D.B.I.); near Ilkley, 1/6/52.
Hognested, Norway, 22/6/49, as young; Hornsea, 25/12/52.
Near Malmö, Sweden , 2/6/51, as young; near Whitby, 7/1/52.
Near Stavanger, Norway —/7/51 as young; near Halifax —/8/52.

Bred in many places. At one colony many young were found dead apparently poisoned either intentionally or accidentally—it might have been well to have had one or two examined. There were large roosts for periods at Wintersett. *c.* 1,000 gulls, November 1st (C.N.), Eccup, *c.* 8,000 gulls, December 7th (A.H.B.L. ; and most of *c.* 12,000 gulls there on February 14th were ' blackheads.' (J.R.G.). On October 18th at Haxby, and east of York, on the 19th, some were noticed taking acorns from the trees by encircling the trees and diving (F.J.).

481. Common Gull.—Ringed:

Finland (60° 15′ N., 26° 25′ E.), 25/6/52, at Bridlington, 25/11/52. Found by M. Sellers.
Denmark, 13/7/41; near Bridlington about April 1951.

Large numbers roosted at Stocks Reservoir, *c.* 2,000, November 16th (C.N.).

482/3. Herring Gull.—*Circa* 3,000 came into roost at Swillington on January 20th (C.N.).

484/5. Lesser Black-backed Gull.—Ringed birds have been recovered.

Ringed :

Pennines, 29/7/51, by G. A. Bowden; Santo Antonio (Algarve) Portugal, –/2/52.
Pennines, 8/7/51, by J. W. Watts; Porto Santa Maria (Cadiz) Spain, 1/1/52.
Pennines, 29/7/51, by G. A. Bowden; Nemours, Algeria, 1/1/52.
Pennines, 22/7/51, by G. A. Bowden; Rabat, Western Morocco, 15/12/52.
Pennines, 26/7/50, by G. A. Bowden; Santa Cruz, Teneriffe, 28/1/51.
Pennines, 21/7/51, by Davis & Iles; Santander, N. Spain, 16/11/51.
Pennines, 21/7/51, by Davis & Iles; Mouth of the Douro, Portugal, 30/12/51.
Pennines, 21/7/51, by D. B. Iles; Kincardine, Fifeshire, May 1952.
Pennines, 15/7/51, by D. B. Iles; Alnwick, June 1952.
Pennines, 15/7/51, by R. F. Dickens; Peniche, Portugal, 23/2/52.

The Roeburndale colony was smaller this year as the result of shooting (D.B.I.). A few birds of both forms have occurred during the winter months.

486. Great Black-backed Gull.—Always recorded at Spurn with maxima in late August (*c.* 500 on the 23rd and 26th); and the maximum at Teesmouth was recorded on August 24th (C.N.).

Ringed, Stavanger, Norway, 27/5/51; Bridlington, 10/4/52 (E.P.L.).

The species occurred inland, mainly very few but at a number of places. There were *c.* 30 (11 immature) at Swillington Ing on January 20th (C.N.).

487. Glaucous Gull.—A second year bird was at Scarborough on February 27th (G.R.E., W. R. Grist); and juveniles on January 9th (two), and one on February 8th; and one on November 8th (A.J.W.). An adult occurred at Filey on December 27th (A.J.W.); and at Spurn one on December 29th, and two with Greater Blackbacks on December 30th (G.H.A.).

488. Iceland Gull.—One at Scarborough on January 19th and February 5th (A.J.W., see *The Naturalist*, July 1952).

489. Kittiwake.—Very few are recorded at Spurn. On October 11th a series of parties of juveniles passed northward; and H. O. Bunce noticed a similar movement of Kittiwakes off Flamborough Head. A freshly dead immature bird was picked up on Royd Moor on August 23rd (J.C.S.E.); and adults were recorded—two at Aberford on February 2nd (J.M., V.S.C., H.F.), one Swillington Ing on March 30th (K.D.), and one at Gouthwaite on August 10th (A.F.G.W.).

491. Great Skua.—One was watched at Spurn at 30 yards range as it harried a a Sandwich Tern on August 22nd; the large white wing-patch was very noticable (J.C.L.).

493. Arctic Skua.—Recorded at Spurn on a number of days from July to early September. One colour-ringed by K. D. Mason in a nest at Fair Isle on July 17th; which flew ten days later, was found on shore at Bridlington on August 26th (W.A.B.).

496. Razorbill.—Many oiled birds seen at Spurn.

498/9. Guillemot.—Four bridled birds out of 198 examined on Bempton Cliffs by I. G. Brown corresponded proportionately with A. B. Walker's experience.

502. Little Auk.—The decomposed remains of one were found near Goathland on April 10th (A.B.W.).

504. Corncrake.—Known to breed near Austwick and Lawkland (C.A.C.), Barnoldswick (A.P.); and near Helmsley where three young were killed by the reaper (R.M.G.). The species was heard calling at 16 places at least, which is more than usual. At some of these places birds did not remain. Two were caught at Spurn in September. One brought to the Huddersfield Museum on August 18th had been killed against wires (E. W. Aubrook).

509. Water-Rail.—Bred near the Swale (J.P.U.); and probably elsewhere. Occurs regularly near Newmillerdam from October to March (J.C., G.C., etc.). A wired bird was found near Yafforth on April 14th (J.P.U.). A bird was killed by a dog on March 2nd east of Doncaster (R. Brocklesby). Occurred near Copgrove (C. Webb), and Farnley Lake (Wharfedale N.S.), at Croft (K.B.), and Cliffe (E.B.B.), and Esscroft (K.C.C.), between early October and late March.

510. Moorhen.—There were *c.* 150 in Swillington Park on December 20th (C.N.).

511. Coot.—Concentrations have been recorded of *c.* 2,000 at Swillington Ing on December 7th when most of the smaller waters were frozen; and of *c.* 400 on December 14th and 21st (K.D.); of *c.* 70 at Farnley Lake on October 5th (C.N.); of *c.* 60 at Malham Tarn on September 21st (J.K.F.); and of 98 on January 12th at Wintersett which fell to eight by April 9th (J.C.).

513. Black Grouse.—Bred in Bowland (K.G.S.) where often flushed (A.P.). Six birds in the Ewden Valley are said to have caused damage to young conifers (D.R.W.). A party fed on birch buds near Ribblehead on December 13th. Noted occasionally on Whernside and Gearstones Moor (P.Y.).

519. Red-legged Partridge.—The species is scarce in the Dales but C. Nelson noted a pair near Lindley Wood on April 29th; and D. B. Iles saw a bird at Fewston with two Common Partridges on May 4th. I regard it as not very infrequent in the Knaresborough-Copgrove area, which H. Jowsey and J. R. Rathmell confirm.

520. Quail.—Seen and heard on allotments near West Park, Leeds, in June, bur after a nest with one egg had been found the birds disappeared (J.D.H.). A nest at Kirk Hammerton on July 25th (R. T. Stanyforth), was spoiled by harvesting hay. Single birds were heard near Farnley on June 11th (D.B.I.); at Wilsden from June 2nd to July 7th (C.D.R.); near Leven Canal on July 26th (R.C., G.H.A.); at Cloughton on June 25th (R. S. Pollard); at Ellerburn as early as a week previous to May 22nd (R.M.G., M.C.); and up to six birds about a large field near Nunthorpe (G.A.E.). One occurred at South Gare on September 2nd (J. Hyatt). One was shot on Leven Carrs on October 22nd (H.O.B.).

PUCCINIA PRATENSIS BLYTT
A Rust new to Britain

W. G. BRAMLEY

DURING the Autumn Foray of 1945 at Thornton-le-Dale a rust was collected on *Helictotrichon pratensis* (L.) Pilger (*Avena pratensis* L.). Only uredospores were present and the specimen was provisionally placed under *Puccinia dispersa* sens. lat. on account of the well-developed colour of the spore wall, although the species had not been recorded on this host.

During 1952 a communication from Dr. Malcolm Wilson of Edinburgh hinted at a probable name provided teleutospores could be found. Opportunity to visit the locality being more favourable, several visits were made though it was not until November 9th that teleutospores were obtained. Specimens submitted to Dr. Wilson proved his suggestion to be correct and that the rust was *P. pratensis*.

The following is a short description of the species supplied by Dr. Wilson.

Puccinia pratensis Blytt

Uredospores. Sori hypophyllous, minute or medium size, ellipsoid, oblong or oblong linear, surrounded by the ruptured epidermis, pulverulent ferruginous, uredospores globose, subglobose or obovate, coarsely aculeate, yellowish-brown, 27-35μ, pores many.

Teleutospores. Sori similar to uredosori up to 1.5 mm. long. Teleutospores broadly ellipsoid or ovate, rounded at both ends, apex not thickened, not or slightly constricted, densely verruculose, blackish brown, 35-50 × 27-32μ, epispores up to 6μ thick, pedicel hyaline, thick, fragile.

On leaves of *Helictotrichon* (*Avena*) *pratensis*, Sweden and Norway (north of Arctic Circle).

Teleutospores produced in uredosori from middle of August to October. They differ from all other North European grass rusts by being verrucose and possessing deciduous pedicels.

The British specimens differ only in that the sori are epiphyllous. Fresh uredosori were present on 9/11/52. Three or four small patches of the host have been found but the rust appears to be limited to the first locality found and is restricted to a few square yards.

Locality, Allerston Forest, Thornton-le-Dale. Grid Ref., Square 86.87.

Specimens in *Herb.* Dr. M. Wilson and *Herb.* W. G. Bramley.

Display of Canada Goose.—Upon arrival by the lower lake at Ripley on April 6th, 1952, I found a pair of Canada Geese (*Branta canadensis canadensis*) displaying vigorously on the water.

After mutual head bowing, coition took place, after which the gander immediately assumed a posture with neck stretched vertically and bill held slightly above the horizontal and both birds wagged their tails. The goose began to preen her wing and upper tail coverts and the gander followed suit some fifteen seconds later. The gander then stood up in the water and beat his wings several times after which both birds commenced bathing movements.

Subsequently, it was only possible to watch one bird at a time through a × 25 telescope. The gander dipped his head and neck into the water to throw the water backwards over his body and preened his mantle and wing feathers. His next action was unexpected; the gander dipped his head and neck into the water and rolled right over on to his back with legs and black webbed feet waving in the air. The whole of his creamy-white underparts were revealed as he retained this position with head and neck below the surface for several seconds before rolling back to the normal position.

Both birds continued to preen and then commenced furious wing beating and splashing with the feathers of the neck and body puffed out. Suddenly both birds 'crash-dived,' spray flying into the air, and remained under the surafce for approximately seven seconds before they reappeared simultaneously close to where they had dived, and resumed preening. Eventually, without any more recognisable display, the pair swam to the shore to graze. Of the ten Canada Geese present on the lake, all but two odd birds appeared to be paired.

It would appear that the exaggerated bathing movements and the diving were probably part of the post-coitional display.—A. F. G. WALKER.

Yorkshire Birds, by **Ralph Chislett.** Pp. 335, with 10 photographic plates and map. A. Brown & Sons, Ltd. 25/-.

Here at last is the long-awaited and much-needed book on Yorkshire birds which is to chronicle the many changes which have occurred in the bird life of the county since the publication of that old standard *The Birds of Yorkshire* by T. H. Nelson and W. Eagle Clark (1907), now 45 years ago.

No one is more competent than Mr. Chislett to estimate the present status of each species and to trace the changes which have taken place. He has lived a long and active life in Yorkshire and has always been in intimate touch with every ornithologist and bird-lover in that far-flung county, the home of so many famous Natural History Societies and Field Clubs. As compiler of the Yorkshire Ornithological Reports for the last twelve years, every record, reliable and unreliable, has passed through his hands and come under his shrewd scrutiny; every change in the status of a species has taken place under his watchful eye and its importance has been carefully assessed. The results of this wide experience are now set forth for the benefit of the reader. The essential records from the past are recalled, but nowhere does the book degenerate into a mere catalogue of dates, and the account given of each species reads like the biography of a living bird.

His knowledge of the county is demonstrated in Chapter II, Physical and Topographical, in which the reader is taken on a conducted tour of that large and varied county, which is briefly but picturesquely described; an admirable preparation for the work that follows. Mr. Chislett draws attention to the many changes which have taken place in the county within the last half century and shows how these have affected the distribution of many species of birds. Land reclamation, drainage, more intense methods of cultivation, and the felling of deciduous trees have deprived birds of feeding and breeding haunts, while, on the other hand, the extension of ' flashes ' in the low country and the formation of large new reservoirs, often amongst the hills, have attracted more passage migrants, particularly waders, and provided wintering places for wildfowl.

As a life-long student of migration and primed with his more recent experiences as a warden at the Y.N.U. Bird Observatory at Spurn, Mr. Chislett is able to contribute a most interesting chapter on migration. Towards this fascinating subject he adopts a cautious attitude. He writes—' Data is still inadequate, and even to piece together such conflicting evidence as we have is an almost impossible task.' It has often been proved that ' a little knowledge is a dangerous thing,' but it is not so in the hands of Mr. Chislett. He takes nothing for granted, but marshals such evidence as has been collected in Yorkshire and stimulates his readers to continue the search for more. With the establishment of more observation posts and ringing stations along the east coast, the work at each link in the chain assumes a greater relative importance and all students of migration are grateful to the author for giving so many details of the observations made at Spurn.

Towards some of the more recent developments in the science of ornithology Mr. Chislett adopts a conservative attitude. In classification he follows the time-honoured system of the *Handbook* and not that of the new B.O.U. *Checklist.* In nomenclature he is content with the binomial system and hesitates to follow the ' splitters ' far into the realms of sub-species and race. He only uses trinomials where sub-species are well authenticated and even then he brings these together for general consideration under the heading of the species as a whole. As he says—' With so large a proportion of the records of to-day dependent upon accurate sight diagnosis and so many of the sub-specific forms indistinguishable in the field, I have used binomial nomenclature treating under the species heading such sub-specific forms as have been distinguished in the field or diagnosed as specimens or as live birds being ringed.' Even the Bean and Pink-footed Geese are discussed under one heading and this is reasonable considering how seldom it is possible to differentiate between the two species when only seen as high-flying flocks or at long distances in their roosting haunts.

Like all writers of county avi-faunas, the author has to bear in mind the fact that his words will be read by those whose interest in birds is derived from their desire to collect them or their eggs. Great care is therefore necessary to avoid giving information about the breeding places of rare species. The reader would like to be told more about the recent nesting of the Montagu's Harriers, the Black-necked Grebe, Temminck's Stint and the Little Ringed Plover; but the author is commendably circumspect. Particularly interesting are his accounts of the increasing

occurrence of the Black Redstart, the rapid multiplication of the Little Owl, the colonisation of the coastal cliffs by the Fulmar, the persistence of the Peregrine against fearful odds and the virtual extermination of the Corncrake.

Those who are accustomed to look upon the Yellow Wagtail as an inhabitant of low-lying water meadows will be interested to learn that, as has already been pointed out by Dr. Stuart Smith in his exhaustive monograph on this species, in Yorkshire the Yellow Wagtail breeds far up the western dales, even nesting at an elevation of up to 1,200 ft. The author suggests that the more widespread breeding of the Short-eared Owl in Yorkshire may be due to a spill over from the Cheviot area, where, in some recent ' vole-years,' they had multiplied so rapidly as to have outstripped the always variable food supply. Further evidence for this can be supplied by the fact that this dispersal, over hitherto unoccupied areas, has been very marked in both South Northumberland and County Durham. Mr. Chislett sums up his account of the Long-eared Owl in the words—' This species is now scarce.' This reduction in numbers has been noticed beyond the confines of Yorkshire, though in some areas it has lately been observed to be breeding in woodlands in the neighbourhood of towns and villages, where it avoids molestation from gamekeepers and, owing to its silent and secretive habits, escapes notice. Possibly this habit may yet save it from extinction in Yorkshire. It is interesting to note that in spite of much tree-felling some of the older Yorkshire heronries continue to survive and that in some of them the number of breeding pairs has increased, particularly since the disastrous year 1947. The recovery of ringed birds has shown, however, that the marked increase of Herons in autumn and winter is due to an influx from Scandinavia rather than to successful local breeding. Of the Oystercatcher, as a nesting species as far inland as the shingle beds and fields of the Ribble and the western tributaries of the Ouse, Mr. Chislett writes—' It is probable that the colonists came from the west coast where the species is much more common than on the east coast.' It is therefore of interest to record here that birds breeding in south-west Northumberland in the valley of the Tyne west of Hexham, are invariably noted to arrive from the west, using the Tyne Gap as a passage route.

In his summary of Yorkshire birds (p. 6) Mr. Chislett gives the total number of species recorded in that county as 320, leaving out of account 35 ' sub-species and recognised races.' A comparison of this figure with the 426 species named in the newly issued B.O.U. *Checklist of the Birds of Great Britain and Ireland* (1952) shows how richly Yorkshire has been endowed with bird life, while it also bears witness to the zeal of her many generations of watchful observers.

The volume closes with an Addenda which enables the author to relate the occurrence of a new and most interesting species in the county—the Pallid Harrier, obtained on October 2nd, 1952. Only three or four specimens of this rare straggler have previously been recorded in the British Isles.

Readers, particularly those who live outside Yorkshire, of whom there will be many, would have been grateful for a rather more adequate map than has been provided; or, at least, for a more legible one.

The one serious shortcoming is that the volume bears no date. There is nothing to inform the reader when the book was published, nor up to what year the records extend. It is stated in the first chapter, Introductory, that the book ' contains estimates of the status of all species at the time of writing,' but what that time was the reader is not told, nor is it mentioned elsewhere in the volume. In future years the date must be conjectured from internal evidence alone. In the Addenda, p. 324, is found an account of the ' wreck ' of Leach's Fork-tailed Petrels which occurred in late October 1952; this establishes the last date up to which records were included. Owners of the volume are recommended to write the date of publication, December 1952, on the title page, for the benefit of those who will use it in days to come.

Unlike its unwieldy predecessor, *The Birds of Yorkshire*, this work is in one volume only, compact, concise and self-sufficient, admirably suited alike for the worker's desk and the reference library shelf. The format displays the precision and taste of the author and the clear type and good paper is a credit to the publishers.

G.W.T.

Rare and Extinct Birds of Britain by **Ralph Whitlock,**. Pp. 224, with 84 photographs and 2 drawings. Phoenix House Ltd., 21/- net.

Rareties have been ignored by three books published recently. Fisher's *Bird Recognition*, Vols. I and II, excluded birds known to have occurred less than 100

times. Fitters' *Pocket Guide* is minus information about birds credited with less than 20-50 occurrances. Hollom's *Popular Handbook* reduces the handicap to ' less than ten or a dozen times.' Now we get a book that excludes the common species and which in conjunction with any of the above mentioned will cover the whole field. None of these four books could have been written without the aid of Witherby's *Handbook*, which remains incomparably the best book on British Birds, even in the original edition.

Mr. Whitlock divides birds under seven headings: Lost Breeding Species, Rare and Local Nesting Species, Rare Birds of Passage and Seasonal Visitors, Vagrants, and Eccentricities. An epilogue deals with additions to the British list since publication of *The Handbook*, with further occurrences of rarities, and with changes in status and distribution that are taking place. A glossary links our visiting species and races broadly with the European, Asiatic, and American areas and islands where they breed commonly.

Avoiding both statistics and technicalities Mr. Whitlock briefly, in readable prose, discusses the historical, geographical, ecological and some of the diagnostic features. He hardly helps towards diagnosis of races. For distribution, and for occurrences of rareties, one feels that the *Handbook* has been relied upon too much. Although some regional reports have been consulted, and I know the author visits Yorkshire, we find the Pied Flycatcher apparently confined to the north-east ' corner ' of the county, which is very far from being the case. There have been two further records of the Greenish Warbler in recent years; and such a book published in 1953 should have included a reference to the attempted breeding of the Temminck's Stint in Yorkshire in 1951. Mr. Whitlock faithfully echoes *The Handbook's* 13 occurrences of the Siberian Lesser Whitethroat oblivious of those handled in several recent years at bird observatories (including Spurn). So much is happening ornithologically today that for a book to be up-to-date at the time of publication is almost impossible. No author can expect a book about birds to remain up-to-date for long, even as to common species concerning which much is being added to our knowledge.

This book contains a great deal of interesting matter; and will be useful for reference. It can be recommended, particularly as supplementary to the books mentioned above. The well-produced illustrations are well by known bird photographers and form an excellent collection. R.C.

The Country Naturalist. A new popular series of monographs for the Nature Lover. Edited by **James Fisher.** Collins, 3/6 each.

No. 1. Birds of the Field, by **James Fisher.** Pp. 36 with 39 illustrations, 16 in natural colour photography, and 23 in black and white.

No. 2. Butterflies of the Wood. Written and illustrated by **S. and E. M. Beaufoy.** With 101 illustrations, 20 in natural colour photography, and 81 in black and white.

The first reaction to a hurried glance through these two pioneers of Messrs. Collins' new series is that the really beautiful and accurate illustrations alone are worth the money. Detailed reading more than confirms the first favourable impressions. Some critics might object to attempts to segregate into habitat groups, creatures living in a three-dimensional freedom but the authors have justified themselves. Mr. Fisher includes all those birds which spend the most important part of their lives in fields in their search for food, and in some cases actually nesting in fields. He lists 40 species and for a small book, the *Birds of the Field* is not merely readable but is crowded with up-to-date material, and there is no irritating padding. Such interesting matters as regional differences in bird song (e.g. songs of Chaffinch and Yellow Hammer), bird population, etc., are all dealt with, and the points are clearly set out. Two items have been noted for comment: the author says that Rooks begin their nest-building in March. The writer of these notes has watched Rooks carrying twigs and inserting them in nests on most days since February 17th this year. This is not exceptional for East Yorkshire. On p. 20 line 22, we read that the Tree-Sparrow may be distinguished from the House-Sparrow by the ' copper-nob ' of the *male*. But in the Tree-Sparrow the sexes are alike in plumage. As stated, the illustrations are very good. The marvellous colour photograph by E. H. Ware of a pair of Chaffinches feeding young at the nest not only appears in the body of the text, but also adorns the cover. This alone should promote rapid sales!

The authors of the butterfly book have also managed to produce in 36 pages a really useful account of their subject. Changes in timbered areas in historic

times are clearly described and the resultant variations in insect population and distribution are discussed in a succinct and yet most interesting manner. Life histories of relevant species are given with many useful comments, and most of the well-printed coloured figures are of specimens from the H. D. and E. B. Ford Collection. Readers will be pleased to know that Messrs. Collins have in preparation many more similar " monographs " which will include those on Flowers of the Seaside, Birds of Town and Village, Flowers of the Wood, and Birds of the Seaside. W.R.G.

The British Journal of Animal Behaviour, Official Journal of the Association for the Study of Animal Behaviour, edited by **Alastair N. Worden** and **B. A. Cross.** Published by the Association for the Study of Animal Behaviour and Bailliere, Tindall and Cox, Ltd. Pp. 40. Annual Subscription, 27/6.

The British Journal of Animal Behaviour is intended to be a quarterly journal under the aegis of the Association for the Study of Animal Behaviour. The Journal is the legitimate successor to the *Bulletin of Animal Behaviour* formerly published by the Association at irregular intervals.

Comparitive ethology is a relatively new science owing much to such British workers as Julian Huxley and F. B. Kirkman although stemming more directly from the pioneer theories of Lorenz. In an editorial foreword the President of the Association, Dr. W. H. Thorpe, discusses the future of the journal and looks forward to a fruitful co-operation between workers in the pure science and in the veterinary fields, urging that while the latter have undoubted benefits of opportunity, the former may in considering wild strains discover the key to the interpretation of behaviour under domestic conditions.

The first number contains papers on such facets of animal behaviour as the inability of honey bees to communicate colours, sex hormones and human behaviour, on the effects of various olfactory deterrents mixed in food offered to rats and no less than three papers on the consideration of grazing behaviour in ruminants and in rabbits. A controversy between Dr. R. A. Hinde and the Rev. E. A. Armstrong reveals a fundamental weakness which so often bedevils the study of animal behaviour inasmuch that its devotees feel the need for recourse to a jargon which purports to have general application and which is in consequence seldom sufficiently explicit in particular reference. This leads to purely terminological argument with each protagonist fervently claiming Humpty Dumptywise that his words mean what he means them to mean. This attempt to interpret behaviour within the self-imposed limits of a technical jargon betrays a dangerous fallibility of outlook since it inevitably results in the interpretation being strained to conform with the available terminology. The bird-behaviourists are at present the worst offenders and cheerfully apply the same portmanteau expressions to members of diverse orders although patterns of behaviour act as much in the way of specific insulators as do physiological differences and their critical appraisal is stultified by stereotyped expression. Lucidity should be the keynote of scientific exposition.

The present and increasing tendency for specialist fields to maintain their separate journals admits of the freer publication of papers but demands of the private student either access to an adequate liaison service or a bottomless purse. One wonders at times if the discipline imposed by the publication of fewer, more comprehensive journals might not serve to exert a selective pressure which would in the long run be in the best interests of science as a whole. Or must we be prepared one day to welcome a journal devoted to the psychiatry of animal behaviourists? E.H.

Big Red, by **Henry G. Lamond.** Pp. 279. Faber and Faber, 1953, 15/-.

This book belongs to a class popularised by Henry Williamson and others in this country and is biographical in the sense that the story is woven around the life of a particular animal, in this case a Red Kangaroo. The book must therefore class as fiction and its animal hero may be expected to get into and out of every sort of difficulty.

Whether or not the naturalist can gain advantage from reading this type of book will depend on the powers of observation of the author and his ability to record correctly the reactions of his subjects under widely varying conditions. There can be no doubt that the writer has closely studied the habits of the Red Kangaroo and that the story gives the reader a good insight into the lives and habits of these large and primitive marsupials. A good impression is also gained of life in the Australian bush with its succession of droughts and bush fires, rains and floods.

A good many terms are used which will be new to the reader—for instance, a

' Moff ' is a hermaphrodite and a ' Joey ' is a young kangaroo not yet independent. The reader will also be reminded of the unusual reproductive arrangements of the marsupials; the embryo being born at a very early stage of development and finding its way into the pouch of the mother where it becomes fused to one of the four teats. He will also become aware, perhaps for the first time, that a kangaroo does not possess sweat glands and attempts to control its body temperature by repeatedly licking its wrists to encourage evaporation.

A four-page glossary at the end of the book elucidates any unusual terms used by the Australian bushman. E.W.T.

Animal Forms and Patterns, by **Adolf Portmann.** Translated by Hella Czech. Pp. 246 with 117 figures from drawings by Sabine Baur. Faber & Faber, Ltd., 1952. 25/-.

This is a book for those who enjoy contemplating the shapes of parts and wholes, the relations between structures and functions, the details of difference and of similarity, and all those features, great and small, which make the animal and fit it in its enviroment. It is essentially descriptive in words and drawings. The translator has made an easily readable translation, but, quite apart from the words, the illustrations strike the eye. These are derived from beautiful ink drawings, not only accurate but artistic, and extremely varied in their application. Although the intention of the author seems to be objective, there appears evidence throughout of an aesthetic relation to the subject and a desire to arouse a similar response in the reader.

The book contains a short bibliography of suitable reference works, a table of classification of animals mentioned, a glossary, and an index. E.P.

The Lost Woods, by **Edwin Way Teale.** Pp. 224 with 25 plates. Robert Hale, London, 1953, 21/-.

Edwin Way Teale is an American already well known in this country by his *Grass-Root Jungles, Near Horizons* and *The Golden Throng,* all of which showed his prowess as a photographer besides being adequate textually. The present work will not diminish his reputation though it appears largely to be a collation of articles written in the first place for the magazine press and has that ephemeral quality which together with its price will no doubt determine that the majority of its readers will select it at the library rather than the booksellers.

Mr. Teale is a countryman, but withal one whose appreciation of nature has been heightened by an urban life and his perceptions are enhanced by a wide background of knowledge. In the thirty dissociated chapters of this book he deals effectively with such things as the unassuageable nostalgia for the scenes of boyhood—as seen through the eyes of the boy—with king-crabs and beavers, mangroves and astronomy, with Thoreau and with snowflakes. He tells not only how things are but why things are and his facility and felicity of expression enlivens the essential soundness of his observations.

The photographs which grace these articles are as perfect as they can be.

All in all the book contains no novelty but the author has the uncommon gift for seeing both the wood and the trees. He is plainly a naturalist who finds natural history both a profitable and a pleasant pursuit and in return there will be few who will not derive both pleasure and profit at his hands. E.H.

Photograms of the Year, 1953. Pp. 32 with 96 plates. Published for *Amateur Photographer* by Iliffe & Sons, Ltd., Dorset House, Stamford Street, London S.E.1. 12/6.

The fifty-eighth issue of this annual review of the world's photographic art contains the usual fine selection of pictures covering every aspect of pictorial art and technique. The photographs have been chosen from entries which have appeared in many of the most important photographic exhibitions throughout the world and they represent the work of some twenty different countries. The book includes a résumé of photographic work during the year written by Frederic Robinson and a critical commentary by Bertram Sinkinson (in English, French and German) on the entries selected for reproduction.

As this superb collection contains pictures which have satisfied the most fastidious experts it is superfluous to add that photographers with less ultra-critical standards and all those who are content merely to enjoy beautiful pictures without dissecting them, will find the contents of this book richly rewarding. Nearly all the pictures can be studied over and over again with undiminished enjoyment.

Early Man in the Halifax District, by **Geoffrey G. Watson.** Printed at the request of the Halifax Scientific Society. Pp. 102. Halifax, 1952. No price quoted.

The author endeavours to place the many records of pre-historic man in the South Pennines in their correct relation to the evolution of early human culture as a whole and in consequence the volume is more comprehensive than the title suggests. It is inevitable that there is much overlapping with the earlier publication by J. A. Petch, published by the Tolson Museum, Huddersfield. If the author's intention was to stimulate the interest of visitors to the local museums in local archaeology, this volume will undoubtedly further that object. It is unfortunate that the book is marred by a large number of typographical errors, e.g. stratography for stratigraphy, Elbollon for Elbolton, Warcock Hill in three different spellings, while throughout there seems an unwarranted and often incorrect use of commas. It is difficult casually to locate any special site and a short index, particularly of Pennine localities, would add to the value of the volume. H.C.V.

Algues d'eau douce de la Guadeloupe et dépendances, by **Bourrelly, P. and Manguin, E.** Pp. 282 with 595 figures in 31 Plates. Sedes, Paris, 1952, n.p.

This book adds considerably to our knowledge of tropical American fresh-water algae. Collections were examined from lakes, streams, pools, mosses, liverworts and various more or less terrestrial habitats, and the algae are grouped according to station and habitat. Aerial algae were richly represented. Some 800 species are recorded of which over half are diatoms. Desmids were relatively rare, and purely tropical genera such as *Ichtyocercus*, *Triploceras* and *Phymatodocis* absent. Among the diatoms it is shown that many species recorded for Tropical Africa, Java and Sumatra also occur in the West Indies. Blue-green algae were abundant in the favourable climate. Some sixty new species and many varieties are described.

The Countryside Round the Year, by **Walter Shepherd.** Pp. 160 with over 400 line drawings. Herbert Jenkins, Ltd., London, 1953, 7/6.

The contents of this book are arranged in twelve chapters covering each month of the year. Each chapter describes common wild plants and animals observable during the month. Flowers, trees, birds and the larger animals naturally predominate but butterflies and moths, beetles and other insects, spiders, fungi, bark and habit characters of trees and animal footprints are all covered, and nearly all the plants and animals described are illustrated by the author's own line drawings. A particularly useful feature of the arrangement is the constant comparison of pairs of species such as rook and crow, swallow and swift, viper and grass snake, white bryony and black bryony, gnat and harlequin-fly, etc., which are often confused by beginners. The text is straightforward without embellishments or technicalities, and is equally reliable in all the groups covered and the copious drawings though small are realistic.

What Flower is that? by **E. M. Barraud.** Littlebury and Co., Worcester, 1952, 10/6.

The purpose of the author is to provide an easy means of recognising and naming a few of our commonest wild flowers. If the book leads to a large number of young students learning to name a limited number of wild plants and if they also lay the foundations of careful habits of observation, it will have served a useful purpose.

Unfortunately, accuracy is not the author's strong suit. In every section of the book errors occur. A few of these are instanced here and the list could be much extended if space permitted. Such are the statements that white bryony has a ' twining ' stem, whereas, of course, it climbs by tendrils, that in the primrose the thrum-eyed flowers are male and the pin-eyed female, and that the barren strawberry bears no fruit. Equally unsatisfactory are the illustrations. Those of the lady's bedstraw, chickweed, white bryony, woody nightshade, strawberry and others show numerous errors. Nor has the author taken the trouble to ensure that the illustrations are consistent with the text descriptions. An outstanding instance is found in the drawing of the deadly nightshade. The text states that the leaves (really leafy bracts) are in pairs and that the two leaves of a pair are unequal, yet the illustration shows no paired leaves, either equal or unequal. Similar inconsistency is found in the descriptions of clematis, chickweed and scabious, to name no others.

The first rule of authorship, especially of scientific authorship, is ' To thine own self be true,' and a book in which this rule is broken cannot be recommended as fulfilling even the limited objectives of the author. A.M.S.

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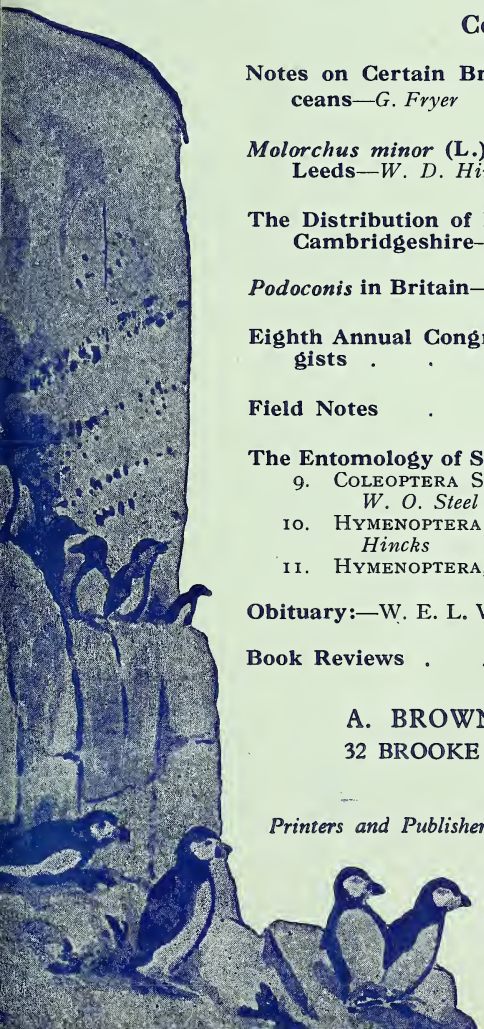

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NOTES ON CERTAIN BRITISH FRESHWATER CRUSTACEANS

G. FRYER

THE worker of any group of organisms from time to time makes observations and encounters phenomena which, while often of an isolated nature, are yet worthy of placing on record as they may at some future date prove of value to a person working on some particular problem. Several notes of this nature are given below. It has been found convenient to give certain notes under a specific heading, while others, not lending themselves to this treatment, are given under title of ' Biological Notes.'

CLADOCERA

Daphnia obtusa, Kurz.—This species is normally an inhabitant of small bodies of water, favouring especially shallow ponds, *e.g.* of the duckpond and farmyard type, so it is of interest to record that a planktonic race exists in Hill Top Reservoir, Slaithwaite, near Huddersfield (Yorkshire). The only other recorded instance of this species occurring as a planktonic form in Europe known to me is that of Gurney (1915) who gives details of such a race occurring in the Perch Lake at Westwick, Norfolk. Like the specimens described by Gurney the individuals from Slaithwaite were quite hyaline—an interesting adaptational character when one considers the usual semi-opaque nature of this species when found in ponds. *D. obtusa* is not common in the reservoir, but the fact that it has been taken after an interval of more than a year since the first finds were made shows that it is an established member of the fauna.

It might here be remarked that there can be no doubt as to the identity of these specimens, for, since the publication by Scourfield (1942) of his researches on the morphology of the '*pulex*' forms of *Daphnia*, supported by the physiological work of Fox (1945, 1946) there is no longer any doubt as to the validity of *D. obtusa* as a distinct species, and the setae on the inner lip of the ventral margins of the valves described by Scourfield were clearly seen in the form under consideration. Incidentally I would here like to propose that these setae should henceforth be called ' Scourfield's setae ' in honour of their late discoverer.

It should be noted that at the time Gurney published his remarks on the planktonic form of *D. obtusa* he did not have Scourfield's work to assist in his determination, though he was such an able systematist that, even with the state of knowledge being as it then was, it is unlikely that he would confuse *D. obtusa* and *D.* '*pulex*'* (itself, with such exceptions as *D. pulex* var. *pulicharioides* Burck. from Lake Lugano, Switzerland, and the form described from the Tatra lakes, Poland, as *D. wierzejski*, seldom planktonic in Europe), and indeed one of his figures at least leaves little doubt that it was with *D. obtusa* that he was dealing.

The phenomenon of a species which is normally littoral in habits becoming pelagic is of considerable interest. If, as seems likely, the planktonic forms of *Daphnia* (and other organisms) were recruited from among the littoral forms, then it is not surprising that one should occasionally find a race, normally littoral, which is, as it were, exploring the possibilities of a planktonic existence, and the planktonic races of *D. obtusa* from Yorkshire and Norfolk are perhaps to be regarded as such exploratory races. The phenomenon is not unknown in other groups of freshwater crustacea, *e.g.* the copepod *Cyclops leuckarti* Claus. occurs both in small ponds and in the plankton of lakes, while *C. hyalinus* Rehberg, normally benthic, occurs as a member of the plankton in the Norfolk Broads. Larger Crustaceans may also exhibit this tendency, for Uéno (1934) describes a pelagic form of the normally bottom-dwelling amphipod *Gammarus pulex* (L.) from a lake in Northern India.

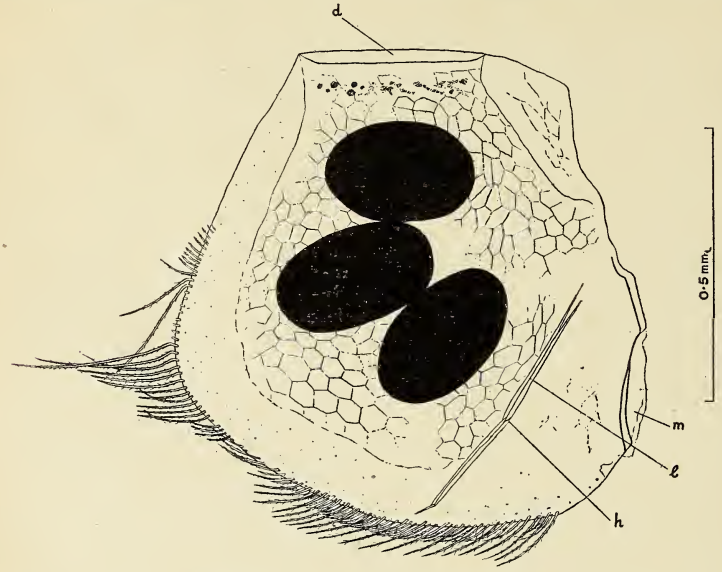
Acantholeberis curvirostris (O. F. Müller).—An ephippium of this species was obtained from a female collected at the end of August 1950 in a pool on Tarn Moss, Malham (Yorks.). Little seems to be known of this structure, especially as regards the number of eggs which it contains, and there seems to be a general impression that the ephippium of *Eurycercus* is the only case of a cladoceran ephippium containing more than two eggs. The specimen in question contained three eggs.

The only information I have been able to obtain on the ephippium of *A. curvirostris* is contained in two papers; one by Weigold (1911), who gives a photograph of a cast ephippium which contains two eggs, and the other by Berg (1929)

* The fact that Johnson (1952) has shown *D.* "*pulex*" in this country actually to comprise two species, *D. pulex* (de Geer) and *D. curvirostris* Eylmann, does not invalidate the above discussion.

who, in his account of the Danish Cladocera, says briefly when discussing ephippial females, ' the latter with 2-4 resting eggs.' Scourfield (1902), however, mentions a very old paper by Schödler (1846) which I have not been able to see, which is devoted entirely to *Acanthocercus rigidus* (=*Acantholeberis curvirostris*), and in which the ephippium is discussed. Scourfield does not mention whether or not Schödler indicates the number of eggs (though presumably he does), but Dr. J. P. Harding kindly informs me that from the manuscript notes of the late D. J. Scourfield he gathers that some of the Macrothricidae produce an ephippium containing from one to five eggs. The ephippium of *A. curvirostris* is illustrated herewith.

An interesting structural feature of this ephippium is the presence of the lateral band of refractive chitin (l). So far as I have been able to discover, the only other



Ephippium of *Acantholeberis curvirostris*

d=dorsal band of chitin. **l**=lateral band of chitin. **h**="hinge" **m**=membranes

cladoceran ephippium exhibiting such a structure is that of members of the genus *Bosmina*, where a somewhat similar band is to be found, and which in spite of the following differences, can I believe, he regarded as homologous to the structure under consideration. According to the figures and description of Scourfield (1901) this lateral band in *Bosmina* is in one solid piece, whereas in *Acantholeberis* it appears to be essentially in four rather slender pieces (the small ventral piece being ignored), and to be ' hinged.' In position also it differs from that of its homologue in *Bosmina*, for in the latter it overlies the single egg and is therefore somewhat dorsal in position, while in *Acantholeberis* it lies anterior to the eggs and is much more ventrally located. It is when one comes to consider the possible function of these chitinous bands, however, that their similarity in the ephippia of the two genera is most clearly realised. Scourfield suggested that in *Bosmina* in addition to strengthening the ephippium they may be endowed with properties of elasticity whereby they press inwards and hold the ventral margins of the valves together. It only requires to be pointed out that in *Acantholeberis* their position is such as to enable them to carry out this function even better than is the case in *Bosmina*, and they are located exactly where one would expect to find them if such was indeed their function. The ' hinged ' nature of the bands may be a refinement of the condition found in *Bosmina*. Where the ventral margins of the valves meet there appears to be a thin deposit of chitin which may have some influence on the uniting of the two valves, but this point could not be properly investigated in the single specimen available.

In its entirety the ephippium is very flat, bulging only in the region of the eggs. From Scourfield's notes on the paper by Schödler one gathers that in this species the ephippium is often attached to plants, though this was not the case in the present instance. However, it is apparent that the long plumose setae with which the ventral and postero-ventral margins of the valves are provided may serve this purpose and also the time-honoured function of attachment to the feathers of aquatic birds, whereby dispersal may be affected.

Pleuroxus aduncus (Jurine).—In May 1951 I collected a jar of material containing an abundance of filamentous Green Algae in a small mere between Kilpin and Saltmarshe, E. Yorks., which was left unexamined until two months later when I noticed that it was swarming with a small cladoceran which it transpired was *P. aduncus*. As ephippia were noticed it is probable that this appearance was the result of the hatching of eggs from these structures. Although there are a few records of this species from the north of England it is nevertheless to be regarded essentially as a southern form, and it is mentioned here because it was accompanied by a typically southern copepod, *Canthocamptus trispinosus* (*vide infra*).

Copepoda

Cyclops venustus, Norman and Scott.—Relatively little is known about this copepod which, according to Gurney (1933), is a decidedly rare species. I have, however, found it in no fewer than thirteen different stations, twelve of them within the Huddersfield district. To judge from the summary by Herbst (1951) of records of its occurrence throughout the whole of its known range this is by far the greatest accumulation of records from any circumscribed area. Its ecology is little understood, for, while it seems to show a marked preference for waters containing *Sphagnum* it is by no means confined to such habitats and has even been recorded from subterranean waters in limestone districts in Switzerland. The Yorkshire habitats are therefore worth while summarising and are as follows.

Six occurrences in *Sphagnum* bogs or seepages from peat into hollows or ' runnels ' containing *Sphagnum*. All these habitats were on moorland, or, in one case in an adjoining clough, save the record from outside the Huddersfield area, this being in a *Sphagnum* swamp with *Molinia coerulea*, under birches, in Clayton Woods, Horsforth, near Leeds. In none of these cases were the pools extensive, the maximum size being about 4 ft. × 2 ft. × 2 ft. deep. In some of the bogs it occurred in numerous small isolated pools, being found in hollows measuring only about 5 in. × 3 in. which were only 1 in. deep. The largest pool mentioned dried up during the summer of 1952, this being, in all probability, an annual event.

Two occurrences in stone troughs sunken in fields and receiving underground water (springs) from adjoining moorland. These troughs each had the same source of supply. In one, bryophytes and algae formed a dense layer on the walls, but in the other such a vegetational cover was very sparse.

Three occurrences in stone troughs receiving springs, in all cases less than one mile from moorland. In one such instance the trough received a very violent stream of water and the species was very sparsely represented indeed. In another trough receiving only a very gentle flow of water the walls were covered with a dense mat of the liverwort *Scapania undulata* (kindly identified by Mr. C. A. Cheetham), and in this mat *C. venustus* was found in considerable numbers.

One occurrence in a large moorland pool several feet deep. *Sphagnum* occurred at one end, but not at the point where *C. venustus* was taken. Peculiar chemical conditions perhaps exist in this pool as it is frequented by a colony of Black-headed Gulls.

The last habitat is the margin of Hill Top Reservoir, Slaithwaite (virtually an oligotrophic lake) where, however, only a single specimen has been found in spite of repeated search. As this reservoir receives drainage from moorland it may have been a chance occurrence, but as one is dealing with a very small organism in a very large volume of water such suggestions should be made with caution. Furthermore, this habitat is somewhat comparable with that in which *C. venustus* was found in Germany by Klie (1928).

Several of these occurrences were at an altitude of over 1,000 ft., the highest being at about 1,250 ft. The *p*H of the Habitats ranged from *p*H 4, or somewhat less, on the moors to *p*H 6·3 in one of the springs, but values were not measured in all cases.

There can be no doubt, however, that acidic conditions prevailed in all the habitats and that the value *p*H 6·3 is high for water in the area under consideration. With regard to the clutch size it might be remarked that the maximum number of eggs/egg sac seen was five and the minimum was two. The other crustaceans with which the species has been found associated give little help in deciding its ecological preferences, for while it has been noted on the moors with such a typical sphagnophile form as *Moraria brevipes* (and Gurney notes its occurrence with *Acantholeberis curvirostris*), it has in other cases been taken in company with such ubiquitous species as *Cyclops agilis*.

To summarise, it can be said that while much remains to be done before its tolerated range of habitats can be assessed, it can be suggested, as a result of finds made to date, that *C. venustus* is to be found chiefly in acidic pools, but also occurs in oligotrophic waters, and in peculiar bodies of water where competition is likely to be minimal, though whether it can be termed a fugitive species in the sense defined by Hutchinson (1951) is doubtful.

Cyclops vernalis Fischer.—A possible resting stage.—In the early part of September 1952 I picked out a very dark specimen of this species from a collection of *C. languidus* obtained from a *Sphagnum* swamp near Goathland, N.E. Yorks. The dark colour was found to be due to the fact that various parts of the body, including parts of some of the furcal setae and some of the spines of the legs, were covered with a rather thick layer of what appeared to be dark amber-coloured chitin. This material was closely adpressed to the body, for when flaked off it was seen to bear the impressions of the minute pittings which are frequently to be observed in the cuticle of this species. Under pressure, a little of this material broke in such a manner as to indicate that it was brittle—much as does an ostracod valve when subjected to similar treatment—this lending further support to the idea that it was chitinous.

It is tempting to suggest that this individual had just emerged from a cyst and that the chitinous (?) covering represented the remains of the cyst. Perhaps the thickened layer represented a cuticle laid down by the last copepodid stage and within which the copepod aestivated. Within this the adult cuticle may well have been laid down in the normal manner. If such was indeed the case the matter could be explained without calling on an adult to moult—a phenomenon which, so far as I am aware, has never been recorded for the Copepoda. The individual in question was a female with developing eggs in the uteri and would thus fit in with this hypothesis.

Gurney (1931, 1933) mentions what appears to be a comparable phenomenon with reference to *C. strenuus*. He says that when ponds containing this species and which have been dry refill with water the copepods reappear as copepodid stages—implying encystment—and that ' they may be covered with brown matter as if just revived from encystment in mud.' Unfortunately he makes no reference to the nature of the ' brown matter.' If in *C. vernalis* the thickened material did indeed represent an old and much modified cuticle, then moulting must take place in such cases in a different manner to that usually employed; namely by the shedding of the old cuticle in a number of separate pieces instead of in one piece.

This observation and the accompanying suggestions, hypothetical though they may be, are recorded because little is known of the means whereby copepods withstand periods of adverse conditions, and it is only by the accumulation of such fragmentary pieces of information that the foundations of experimental work can be laid.

Canthocamptus trispinosus, Brady.—A single specimen of this species was found in the mere between Kilpin and Saltmarshe mentioned earlier. This is a species which is common in S.E. England, but which becomes rapidly rarer outside this area and Gurney (1932) says: ' It has not, so far as I know, been seen in northern England, Scotland, Wales or Ireland.' The fact that it was here associated with the cladoceran *Pleuroxus aduncus*, also a southern species, renders this record even more interesting than would be the case had it been the only southern member of fauna.

Nitocra hibernica (Brady).—Three specimens of this species (a male and two females) were taken in July 1951 in the lower of the two reservoirs at Wintersett, near Wakefield, this being the most northerly locality from which it has been

recorded in Britain to date. Thus, of its distribution Gurney (1932) says, ' Unknown from Scotland and the north of England."

Moraria varica (Graeter).—In his monograph Gurney (1932) was able to give only six records of this species in Britain and he states that, while it seems generally to be associated with decaying vegetation, its ecological preferences are still in doubt. Two finds by the writer indicate that it does indeed prefer decaying vegetation, for I have twice found it in decaying leaves in woodland, namely at Woodsome Hall near Huddersfield, and in Park Wood, Elland. While in the latter wood only a single specimen was taken, in the former case it was exceedingly abundant and occurred in company with large numbers of *M. arboricola* (q.v.). Since the publication of Gurney's monograph, Scourfield (1940) has published a more extensive survey of the fauna of the ' leaf carpet ' of woods and reports the finding of *M. varica* five times in Epping Forest. In this country, then, *M. varica* seems to be definitely associated with such habitats, and further search will probably reveal that it is widespread in such situations.

M. arboricola, Scourfield.—This species was originally discovered in water-filled holes of trees and seems to have a distinct preference for such habitats. It appears, however, that it also finds a suitable niche in the film of water which covers decaying leaves in woodland, for it has been taken in such habitats in the Epping Forest by Scourfield (1940), and I have twice found it in such situations in Yorkshire—in Clayton Woods near Horsforth, and at Woodsome near Huddersfield. As noted above it was abundant at Woodsome.

In the Woodsome specimens the endopod of leg four in the female bore only two setae terminally as did the specimens from which Scourfield (1915) took his original description. Gurney (1932) states that usually three setae occur. On the other hand the males were as described by Gurney in respect of the relative proportions of the segments of the endopod of leg four. It seems therefore that a slight degree of variability exists within this species in different parts of its range and that the Epping Forest race is no more atypical than any other form. (cf. Gurney, 1932, p. 251, for discussion of this point).

Ostracoda

Eucypris crassa (O. F. Müller)—New to Britain.—In his monograph of the Ostracoda of Norway, Sars (1928) gave ' British Isles ' as one of the areas from which this species had been recorded, and quoted Brady as his authority. Wagler (1937), apparently following Sars, also listed this species as British. However, it appears that Sars took this record from Brady and Norman (1889), who briefly described *E. crassa*, but from specimens sent by Lilljeborg from Sweden. The following record is thus apparently the first from the British Isles.

In December 1950 and January 1951 adults of this species occurred in abundance in a grassy temporary pond formed annually when the compensation reservoir at Longwood, near Huddersfield overflows into an adjoining field through a dry-stone wall. At the same time a year later a number of immature specimens were taken but no adults were found. Sars (1928), Wagler (1937) and Klie (1938) are all in agreement that *E. crassa* occurs in temporary pools overgrown with grass, so the British habitat is typical in all respects. With reference to Geographical distribution, this record extends the known range of this species considerably westwards, for Klie, who correctly outlines its distribution, states that it has a predominantly northerly and easterly distribution in Eurasia and that it is unknown west of the River Elbe.

E. crassa is fairly readily recognised by the pointed nature of the valves at both anterior and posterior extremities when viewed dorsally. Satisfactory figures are given by Sars and Klie among the recent authors.

E. elliptica (Baird).—A number of specimens of this rather rare species were taken in the above pond in company with *E. crassa*. In view of the various opinions which have been expressed regarding the ecology of closely allied species it is of interest to note the occurrence of these species together in one pond of a particularly well defined type. A third ostracod, *Cypricercus fuscatus* (Jurine) also occurred in the above pond whenever collections were made.

Biological Notes

Dispersal mechanisms in the Ostracoda.—Some time ago I obtained a specimen

of the aquatic bug *Notonecta glauca* L. to which was attached a considerable number of specimens of the ostracod *Cyclocypris laevis* (O. F. Müller). These were clinging to the respiratory hairs of the abdomen and to the swimming hairs of the posterior pair of legs. That they were firmly attached to the insect is shown by the fact that after a journey of about an hour in a small tube during which their carrier was by no means inactive the ostracods maintained their position, as they did when the insect was tipped into a jar. After some time in this container the *Notonecta* was observed to be systematically combing off the ostracods from its hairy extremities, and a hasty attempt at preservation failed to secure any of the passengers *in situ*.

Since making this observation I have found three references in the literature to similar instances. Kaufmann (1900) records that he has seen *Cyclocypris laevis* clinging to the legs of water beetles in aquaria and suggests that this habit may be made use of as a means of dispersal, while Sharpe (1918) notes that *Cyclocypris* has been observed hanging on to the legs of swimming beetles even though the latter were actively using their legs. (Whether the latter was an original observation or whether Sharpe quoted Kaufmann without stating his authority is uncertain.) Besides these references, Thienemann (1950) in his comprehensive volume in the *Binnengewässer* series devotes about a page to matters concerning the transport of aquatic animals by insects and says (p. 159), 'Ostracods (*C. laevis, serena*) become spread by means of flying insects (such as *Notonecta glauca*)' (translation). Unfortunately no further details or exact references are given, so one is left wondering whether *N. glauca* has been seen functioning as a transporting agent or whether Thienemann merely cited it as a likely example. It is of interest to note that all these records relate to the genus *Cyclocypris* and that in the case of Kaufmann's observation the species in question is the same as that observed by the present writer.

Here we are confronted with what would appear to be an obvious dispersal mechanism similar to that which is fairly well known for bivalve molluscs. However, a few simple experiments have shown that, in spite of Theinemann's categorical statement, this method suffers from some severe limitations. The experiments consisted of taking specimens of *C. laevis*, placing them on a microscope slide in a small drop of water which was then absorbed by filter paper, leaving the ostracod quite dry, and observing the length of time which it was capable of withstanding in this condition at room temperature. The results showed that a period of two minutes or even less was usually sufficient to cause the death of the ostracod. Even allowing for the fact that a small amount of water may be entrapped by the hairs on the legs of the insect carrier (and this seems unlikely) it is improbable that dispersal over any but the shortest distances could be affected by this means. It is just possible, however, that the eggs of an ostracod transported by such means may be viable as they are provided with a double-walled shell impregnated with calcium salts and the cavity contains a relatively large amount of water. In this connection the well-known phenomenon of raising certain ostracods from dried mud may be recalled.

Experiments with *Cypria ophthalmica* (Jurine) showed that this species could exist out of water for a somewhat longer period than *Cyclocypris laevis* though the time was of quite insignificant duration. A chance observation in the field, however, indicates that some ostracods may be able to withstand a limited amount of desiccation. A stone trough was found whose walls were covered with a layer of filamentous algae and in which the ostracod *Cypricercus affinis* (Fischer) occurred in abundance. Now the level of the water had apparently fallen several inches at some time previous to the examination and numerous ostracods were stranded in the algae, some of them being three or four inches clear of the water surface. Rather surprisingly, when they were placed in water these stranded specimens swam as vigorously as if they had never been removed from their native element. It is true that the algal layer may have served as a wick, drawing up water to these individuals, but this observation, nevertheless, indicates that some ostracods at least have the power of resisting partial desiccation, at least for limited periods.

With regard to the tendency for ostracods to attach themselves to moving objects, I have also noted *Eucypris crassa* 'taking rides' on some large specimens of the Isopod *Asellus aquaticus* (L.), but here the tenacious hold seen in *Cyclocypris laevis* was not exhibited.

The crustacean fauna of submerged stones.—In the canal at Golcar, near Huddersfield, occur a number of submerged stones of local origin (*i.e.* of millstone grit), few of which have dimensions exceeding one foot in any plane, and whose surfaces are coated with a thin layer of fine slime together with small amounts of filamentous algae. The slime consists of mud particles with a considerable admixture of diatoms of various species. It was found that if these stones be quickly lifted from the water a number of crustaceans could frequently be seen floundering in the mud film and could be picked off. These included *Cyclops* spp. and the cladoceran *Alona affinis* (Leydig). Indeed the latter species apparently found optmium conditions in this microhabitat, for it was of very common occurrence on the stones and could frequently be obtained in numbers from their surfaces when the dip net failed to secure specimens from the surrounding water and mud surface. However, it transpired that neither this nor the various species of Copepoda were by any means the most numerous crustaceans of this habitat, for on scraping off a little of the mud and placing it in a tube of water swarms of a minute cladoceran appeared, which were quite invisble whilst in the mud and which were identified as *Rhynchotalona rostrata* (Koch). The abundance of this species in comparision with the other organisms found on the stones left no doubt that it was one of the most important constituents of the fauna. *R. rostrata* is stated by Scourfield and Harding (1941) to be a rather rare species in this country and to occur in weakly alkaline waters. Here it occurred in weakly acid water. According to Wagler (1937) it is common on the European continent. It seems probable that in such situations as those described above it may be more common than is generally supposed.

The total crustacean fauna of these stones offers much of interest and a list of species taken is appended.

Cladocera	Copepoda	Amphipoda
Rhynchotalona rostrata (Koch)	*Cyclops agilis S. Str.* Koch	*Eucrangonyx gracilis* (S. I. Smith)
Alona affinis (Leydig)	*C. agilis speratus* Lilljeborg	
A. guttata Sars	*C. macruroides* Lilljeborg	
Alonella nana (Baird)	*C. albidus.* Jurine	
Chydorus piger Sars	*C. vernalis americanus* Marsh	
	Canthocamptus pygmaeus (Sars)	

The first three copepods listed have been found associated on a single stone.

Many of the species listed are of course to be found commonly in other habitats in the canal, but collections made with a net indicate that several of them show a distinct preference (at least in this case) for the surface of the stones where they doubtless obtain their nutriment.

The surface of these stones certainly merits designation as a microhabitat, and, so far as it has been taken, environmental analysis reveals fairly uniform conditions on all the stones. It is doubtful if this microhabitat could be split into a series of even more precisely definable microhabitats, so one is perhaps justified in pointing out the association there of three very closely related copepods, viz. *Cyclops agilis S. str.*, *C. agilis speratus*, and *C. macruroides*—all members of the sub-genus *Eucyclops*, which is regarded as a genus by many recent authors. This is no place to enter into a lengthy discussion such as has taken place in recent numbers of *The Journal of Animal Ecology*, as to whether or not two or more closely allied species can co-exist in the same microhabitat or niche, but two remarks by Williams, who himself holds that such co-existence is possible, are worth quoting at this point. Firstly he says (1947) that ' in the very small communities the chances of getting two species in one genus is too low to be the basis of discussion.' Again he says (1951): ' It is obvious, however, that the fewer the species there are in an association, the less chance there is of finding two congeneric species, even by chance and not by biological causes.' Here we have a very small habitat—a single stone, with a community containing very few species—five cyclopoid copepods to be precise, and of these *C. v. americanus* was of such infrequent occurrence as to be unimportant as a member of the community. (Other, more distantly related, forms are ignored for purposes of discussion.) Of these five species, defying the laws of chance, three are so closely allied as to be separable only by minute structural differences. This fact cannot be interpreted otherwise than as indicating that, although biological competition is probably greater between closely allied species than between distantly related ones, such species are probably suited to similar, if not the same, habitats, and that, as

Williams has said, the advantages of close relationship are probably greater than the drawbacks. The co-existence of these three copepods indicates that, even if the term 'habitat' be read as 'microhabitat' (cf. Bagenal 1951) the so-called 'Gausian hypothesis' that two species with similar ecology cannot live together in the same habitat is erroneous.

It may be recalled at this point that two previous examples of closely allied species living together have been recorded in these notes, namely the ostracods *Eucypris crassa* and *E. elliptica* in a peculiar type of pond, and the harpacticoid copepods *Moraria varica* and *M. arboricola* among the same handful of dead leaves. It will be noted that the cladocerans *Alona affinis* and *A. guttata* were associated in the present instance. The latter example is comparable with the several cases demonstrated by Hutchinson (1951) of the association of a large and a small copepod in the same habitat. *A. affinis* is a relatively large species for the genus, an adult female measuring about 1 mm., while the equivalent dimension in *A. guttata* is only about 0.4 mm. No such argument can be called upon to explain the co-existence on the stones of the three cyclopoids, for size discrepancies in this case are negligible.

Returning to the stones and their fauna it may further be remarked that very young individuals of the amphipod *Eucrangonyx gracilis* occur commonly on their undersurfaces, while the adults, which seek shelter beneath the stones, are rarely found when the latter are lifted from the water. This may be merely a reflection of the greater agility of the adults which are by virtue of this enabled to make their escape, but it seems more probable that the stones with their layer of nutrient material serve as a 'nursery' for the young amphipods.

It must be emphasised that the above remarks hold good for stones examined in one area only though a rather similar biocoenose has been found on stones in certain other places which have been more casually studied. However, a marked difference is to be noted if, to quote one example, one examines the clean stones of a similar size at the margin of Windermere. These are practically devoid of a crustacean fauna, though one cladoceran has been found, rather unexpectedly, to be not uncommon on these particular stones, namely *Sida crystallina* (O. F. Müller), a form more usually associated with reeds and weed beds.

Cyclops attacking fish.—Some time ago I captured a specimen of *Cyclops viridis* (Jurine) which was engaged in an attack on what was obviously a recently hatched fish (a roach?), but which was nevertheless several times the size of its attacker. It is difficult to describe this incident, but some idea of it may be conveyed by suggesting that a rough analogy is that of a bulldog hanging on to a bull! Even when decanted into a suitable container from the tube of the dip net where it was first observed the copepod persisted with its attack, maintaining its hold in spite of this disturbance.

Spandl (1926) states that cyclopoid copepods may attack and seriously injure small fish, whilst Oliva and Sládaček (1950) report attacks by numerous specimens of *C. strenuus* Fischer, and *C. vicinus* Uljanin, upon Axolotl larvae 2 m. in length. These authors also indicate that similar incidents were reported by Babák (1913), but I have not seen this paper myself. I have also been fortunate enough to obtain two further reports of such attacks from aquarists. Mr. J. Nicholson of Huddersfield informs me that he has witnessed attacks by *Cyclops* (species unknown) on newly-hatched tropical fish fry, and attributes the death of a brood of two dozen young to this cause. A similar incident was apparently witnessed by an aquarist in Middlesbrough, but I have been unable to obtain details in this case.

I am at present accumulating evidence that several species of *Cyclops* are markedly carnivorous and the results of this work will be presented in due course. However, it was thought desirable to record the above-mentioned observations in these notes, and I would like to take this opportunity to state that I would welcome reports of any similar incidents which may be witnessed by aquarists.

Acknowledgments

My thanks are due to those persons mentioned in the foregoing notes and also to Dr. A. G. Lowndes who has rendered valuable assistance in matters appertaining to the Ostracoda. I would also like to thank Dr. V. Sládaček for notes on the contents of Babák's paper which is in Czechoslovakian.

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* Not seen.

MOLORCHUS MINOR (L.) (COL. CERAMBYCIDAE) NEAR LEEDS

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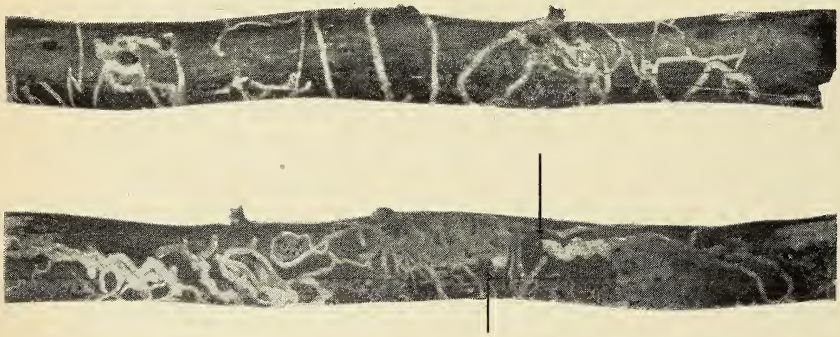
(*Manchester Museum*)

On Saturday, March 21st, the Mycological Section of the Yorkshire Naturalists' Union visited Bramham Park, near Leeds. During the course of forestry work on this fine estate a considerable amount of timber has been cut and at the time of our visit much of it was still lying on the ground. A spruce branch, about 1½ to 2 in. in diameter and 4 ft. long, picked up casually, was debarked revealing along its whole length numerous very characteristic workings of a longhorn beetle and a single larva was seen to be feeding in a shallow cavity on the surface of the wood. The workings are extraordinarily tortuous and frequently cross themselves and other adjacent borings but always remain superficial merely cutting shallowly into the wood. They are very narrow and relatively straight at their commencement but gradually increase in width and tortuosity, finally terminating in a broad, irregular, equally shallow chamber. The narrower borings are packed with frass doubtless pushed there behind the advancing larva. From the terminal chamber the fully



fed larva bores obliquely into the wood to pupate at some depth below the surface. The entrance to this pupal burrow is filled with frass. No other larvae were present on the surface of the piece of debarked spruce, about a foot, brought home, but an adult male of *Molorchus minor* (L.) appeared in my room at the Manchester Museum on April 1st. A second adult, a female, emerged on April 8th. The temperature of this room is very high being regularly over 70° F., and that would account for the early emergence of the adults which are doubtless mature during the winter months but await higher spring or summer temperatures before emerging.

This longhorn is briefly mentioned by Chrystal (1937, *Insects of British Woodlands*, p. 191) as having characteristic larval workings and these are illustrated on plate 31, fig. d. Mr. E. A. J. Duffy's excellent *Monograph of the Immature Stages of British and Imported Timber Beetles* (British Museum, 1953) includes a very good account of *M. minor* with line drawings of the larval galleries and pupal cells. On plate 6, fig. 25, is given a photograph of the larval galleries which however does not quite bring out their characteristic appearance as well as might be expected. Through the kindness of my colleague Mr. Frank Willett and the assistance of Mr. S. Shaw I am able to illustrate these notes by photographs of the larval galleries in the piece of spruce from Bramham Park. The two entrances to the pupal cells are indicated by arrows.

There appear to be only three previous records for this species in Yorkshire and Mr. G. B. Walsh has been good enough to provide me with the following details.

V.C. 61. Escrick, 1 spn., 30/5/1918 (*W. J. Fordham*) by sweeping Umbelliferae in hedge near a wood containing larch, spruce, fir (Yorks. Col. Comm. Report, 1918).

V.C. 62. Buttercrambe Woods, 22/6/35 (*J. R. Dibb*) (Y.N.U. Excursion, 6/1935).

V.C. 64. Selby, 10/7/1950 (*A. M. Robertson*) (Yorks. Col. Comm. Report, 1952).

THE DISTRIBUTION OF BATS (MICROCHIROPTERA) IN CAMBRIDGESHIRE

DAVID L. HARRISON, B.A., M.B., B.CH., F.Z.S.

THE bats are amongst the most remarkable of our native mammals. Perhaps it is because they are secretive and hard to identify that there is still a great deal to be learnt about them. Even their distribution in this country is still very incompletely known. During three years spent at the University in Cambridge I was able to amass much information about the bats of the County.

Altogether twelve species have occurred in Cambridgeshire, but at least half this number must be considered very rare.

Pipistrellus pipistrellus Linnaeus. The Pipistrelle or Common Bat.

This has evidently been an abundant species in the County ever since accurate observations began to be made. The Rev. L. Jenyns (1888) wrote (*in litt.*) that it was then very common in Cambridgeshire, while the Whiskered Bat was very rare, just as it is to-day. Bonhote (1904), stated that it was abundant. There are six specimens in Cambridge Natural History Society's collection taken by Michael Perkins at Ely Cathedral in 1922. Both Barclay (?) and Imms (1938) in more recent years considered it abundant.

To-day it is the only absolutely widespread bat in the County. It is amazingly versatile and I found it in almost every place that I watched for flying bats at dusk. It is to be found in most unexpected places, such as some of the more exposed parts of the Earith-Sutton Washes and (although this is not in Cambridgeshire) I even obtained a specimen right out over the mudflats of the Wash opposite Wolferton and saw several others in August 1947. There was no visible shelter for several miles in any direction. It is found in very large numbers in places that are suitable for bats. Thus the River Cam teems with them in summer evenings all the way from Duxford up through Cambridge to Clayhythe, which is as far as I was able to observe. Perhaps the largest numbers of all that I have seen in the County were on some fine evenings at Byron's Pool. The success of this little bat is partly due to the wide variety of places that it will employ as a roost—crevices in buildings, barns, window shutters, behind bark or in hollow trees, in fact anywhere dark and sheltered. The following list includes all the localities where I definitely identified Pipistrelles during the years 1945-1949:

Arrington, Babraham, Barrington, Barton, Cambridge, Chesterford, Childerley, Clayhythe, Comberton, Dry Drayton, Earith, Fen Ditton, Fulbourn, Gog Magog Hills, Harston, Hauxton, Hatley, St. George, Hildersham, Histon, Horningsea, Isleham, Kingston Wood, Knapwell, Landwade, Little Eversdon, Little Shelford, Longstowe, Madingley, Pampisford, Reach Shepreth, Stetchworth, Stowcum Quy, Sutton, Swaffham Prior, Trumpington, Weston Colville, Wicken Fen.

The sex ratio amongst 67 of these bats that I have handled from Cambridgeshire was 27♂ : 40♀ or 1 : 1·5 approximately.

Nyctalus noctula Schreber. The Noctule or Great Bat.

There is some reason to believe that this fine bat has been more numerous in the past than it is now. In 1776 Pennant wrote that the Rev. Dr. Buckhouse told him he had seen 185 taken from under the eaves of Queen's College and in the second night 63 more. Bell (1837) later commented that these were probably not carefully examined so that other species may have been included, but of all those which were measured the wing expanse was 15″. Jenyns said that it was very common in the neighbourhood of Cambridge about 1878 or rather earlier. Millais (1904) stated that it was abundant around Queens and Jesus Colleges in 1884. There are specimens in the C.N.H.S. collection from Waterbeach (1897, J. L. Bonhote), Magdalen College gardens (1898) and also from Ely Cathedral where two were found in 1922 by Michael Perkins. Writing in 1904 Bonhote considered it abundant. There is one in the British Museum collection from Trumpington collected by Barrett-Hamilton in 1911 and the late J. L. Chaworth-Musters told me that when he was there about 1920 large numbers used to fly over Trumpington in the evenings. Colonel Foster tells me (*in litt.*) that he found one dead at Hildersham in 1937 and both Barclay and Imms considered it to be abundant at that time. From all these accounts it is apparent that it must have been more numerous at any rate around

Cambridge itself than it is at present, for I never saw more than ten at a time over the Backs nor more than twenty at a time in the Trumpington area.

Nevertheless it is still the next most widespread and abundant species in the County after the Pipistrelle. Its numbers do not anything like approach those of the latter species and I found it surprisingly absent in one or two places that seemed ideal for it. Thus none were seen at Madingley in spite of four visits to the area in ideal weather. The combination of deciduous woodlands, meadows and water found there is usually highly attractive to these bats, as for instance at Hildersham and Longstowe and its absence seemed very strange. This species also is most numerous over the River Cam. Its numbers fluctuate locally during the summer, when they tend to congregate locally where there are large numbers of cockchafers.

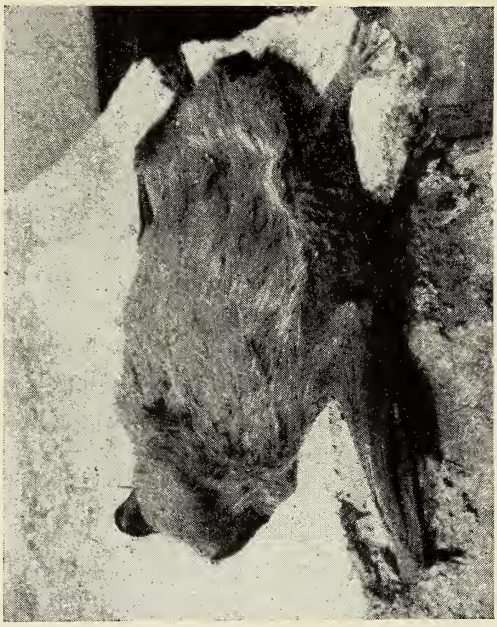


Fig. 1. Leisler's Bat. Life Study by K. F. Burtsal, Esq.

It does occur at times in some numbers in the fenland for Dr. J. G. Harrison and I have both seen some numbers at the Earith Washes in August. Mr. Marsden-Smedley and I saw some Noctules also over the Wolferton mudflats in August 1947. The localities where I have identified it during the years 1945-1948 are are follows: Babraham, Barton, Bottisham, Cambridge, Chear Fen, Chesterford, Childerley, Clayhythe, Comberton, Earith, Fulbourn Fen, Gog Magog Hills, Harston, Hauxton, Hildersham, Histon, Horningsea, Isleham, Little Shelford, Longstowe, Pampisford, Reach, Shepreth, Stetchworth, Stowcum Quy, Sutton, Swaffham Prior, Trumpington, Whittlesford and Wicken.

***Nyctalus leisleri* Kuhl. Leisler's Bat.**

This rare bat is only known to have occurred in Cambridgeshire on one occasion—a gravid female which I obtained in the grounds of Hildersham Hall on May 27th, 1946 (Harrison (1946)). There can be no doubt that it is extremely rare in the County. The fact that this was a pregnant female, however, led me to think at the time that the species must be resident somewhere in the area and not just a straggler, from some far distant part. This view has been borne out by the subsequent specimen obtained by Mr. K. F. Burtsal on June 21st, 1949, at Wendens

Ambo in North Essex (see Fig. 1). This was also an adult female and it was accompanied by another bat which Mr. Burtsal felt sure was another Leisler's Bat. It is interesting that both these localities have been repeatedly observed both before and since these occurrences but no further examples have been seen. A careful search in South Cambridgeshire has not so far revealed it elsewhere, so that its status must remain that of an extremely rare resident. In view of its special liking for deciduous parkland with meadows interspersed with large trees and coppices it is most unlikely that it will be found to occur in the fenland.

***Eptesicus serotinus* Schreber. The Serotine Bat.**

This large and handsome bat is also recorded for certain only once in the County. This specimen was obtained by Mr. Burtsal in my presence in the grounds of Tyrell's Hall, Shepreth, on July 26th, 1947 (Burtsal and Harrison (1947)). It certainly seemed likely that the northern fringe of the distribution of this bat would be found to extend to southern Cambridgeshire, because of the previous record of it at Lowestoft, in Suffolk (Ticehurst (1926)). Mr. Burtsal has obtained a further example at Wendens Ambo, in North Essex on August 9th, 1947 (*loc. cit.*), which shows that the species is not a mere accidental visitor to the area. I have once or twice caught a fleeting glimpse of bats elsewhere in southern Cambridgeshire which I thought were Serotines, but it would not be wise to attempt to record these because it is so easy to be deceived in poor light by a low flying Noctule. I doubt whether it will be found to extend much farther north than Cambridge itself, because the relatively treeless exposed fenland is quite unsuitable for it. The reason why this species is confined to southern England and is most abundant in the south-east remains a mystery—perhaps it was one of the last species to reach our shores from the Continent.

***Plecotus auritus* Linnaeus. The Long-eared Bat.**

The first reference to this species in the County was made by Jenyns who described as *Plecotus brevimanus* a specimen which he found clinging to the bark of a pollard willow at Grunty Fen in the Isle of Ely some time before 1835. It is now known that this was only a Long-eared Bat with somewhat unusual proportions. Miller and Skertchley (1878) using an unpublished MSS. of Jenyns said that he considered the species to be common in most places. There have been remarkably few published records of it since then. There is a specimen in the C.N.H.S. collection from East Lane, Waterbeach, dated November 1897. Strangely enough, it was not mentioned at all by Bonhote in 1904 but Whitaker (1910) mentions that the old shed in which J. F. Turner found two Barbastelles on May 17th, 1910, at Teversham (printed as Feversham, see p. 5) was much frequented by Long-eared Bats also. A further specimen collected at Ely in 1926 is in the C.N.H.S. collection. Dr. Ennion tells me (*in. litt.*) that it occurred during the third decade of this century in woods at Swaffham Prior and he saw it once at Chippenham Fen hawking low down over the sedges one evening. Imms and Barclay both thought it to be not so scarce as the infrequent reports suggested.

To-day it is a fairly numerous animal in the County. One gets the impression at first that it is very local, but this is largely due to the fact that it is a secretive woodland animal, which takes a good deal of finding, since there may be only one or two pairs in an acre of woodland, remaining almost all the time amongst the branches so that one only catches occasional glimpses of them as they flit from tree to tree. It has in fact proved fairly widespread, especially in the more wooded southern part of the County. It was found in the following localities between 1945 and 1949:

Arrington (1947, K. F. Burtsal and D. L. H.), Barrington (two localities, 1946-1947), Bottisham (1947), Cambridge (1944, Queen's College, R. H. Adrian), Comberton (1948), Hildersham (1946, Colonel Foster; 1947, Miss G. M. Rhodes), Isleham (1947, D. E. Sergeant), Pampisford (1947), Reach (1948), Stetchworth (1948, K. F. Burtsal), Swaffham Prior (1947).

***Barbastella barbastellus* Schreber. The Barbastelle Bat.**

Jenyns (1835) mentioned that this species had occurred in the County. G. S. Miller recorded one from King's College Chapel. In 1904 J. L. Bonhote mentioned one occurrence from Bottisham and a single specimen from there is in the University

Museum, it is possible that this is the specimen taken by Jenyns (Miller and Skertchley (1878)) at Bottisham Hall. In the C.N.H.S. collection there are two taken by Michael Perkins, one a solitary male from Ely Cathedral in March, 1925 (not 1923 as noted by Imms), the other a female found beneath the bark of a cricket bat willow at Madingley some seven and a half feet from the ground in November 1923. A specimen from Quy Hall collected in 1924 is in the British Museum collection. Two were found on May 17th, 1910, by J. F. Turner (Whitaker (1910)) in the inside of an old barn at a place printed as Feversham. There is no Feversham in the County so this was probably Teversham. It is interesting to note that in Barrett-Hamilton's monumental work on British Mammals Feversham became Faversham so that the record was all but transported to Kent ! There have been no records of it since then until now.

It is certainly not rare in the County now, but rather local. I found it most abundant around Madingley, perhaps because of all the old timber, thatched cottages and old barns around there. I obtained two specimens there in May 1946 at quite widely separated points and I have seen others flying over the road there at a third place. The area seems to be a long favoured resort for it. In July 1946 I obtained one flying round an ivy-clad ruin near Arrington and saw another and in April 1947 I saw one at Mr. Fordham's farm at Pampisford but I have not been able to confirm this with a specimen. On May 4th, 1947, Mr. Salmon told me that there had been bats behind the window shotters of his cottage on the Gog Magog Hills for many years. I found nine Barbastelles behind these shutters in three groups of three. Two groups were behind one shutter, the other group behind the other. Although I took several specimens, Mr. Salmon told me (*in litt.*) that there were nine bats in a clump there again in April 1948. It occurred in Cambridge itself. It was not until March 9th, 1948, after many trips around the County looking for these bats that I noticed one flying round outside my own room in the Old Court of Clare in the evening ! Mr. Higgins and I also saw one in St. John's College in June 1948. I could find no bats in the roof of King's Chapel where it was recorded by Miller. It is thus a local species in the County and as it tends to emerge late in the evening it is apt not to be noticed even by the experienced observer. It is principally found in wooded country with plenty of old barns, ruins or hollow trees to provide roosting places.

***Myotis mystacinus* Kuhl. The Whiskered Bat.**

This has seemingly always been a rare species in the County. Jenyns (1835) knew of its presence, commenting that he had found it very rarely in houses. Harting (1888) also mentioned that it had occurred but gave no details. The only definite locality rests upon a single specimen in the University Museum from Bottisham, undated. I have been entirely unable to find this bat in the County in recent years. Its presence at Grimes Graves in Norfolk just to the east, however, suggests that it probably does occur. The species prefers caverns in which to hibernate and it may be the total absence of any in the area that accounts for the scarcity of this animal in what would seem otherwise a suitable terrain for it.

***Myotis nattereri* Kuhl. Natterer's Bat.**

There is only one previous record of this handsome bat (see Fig. 2) from the County. Jenyns, writing in 1835 (*loc. cit.*) noted its occurrence in hollow trees in the vicinity of Swaffham Prior and there is a specimen from there in the University Museum. In 1904 Bonhote described it as a scarce but resident species, but gave no details. It is certainly scarce to-day and I did not succeed in finding it in the Swaffham Prior district where it was found before. In July 1949 Mr. K. F. Burtsal found a colony of about 40 individuals hanging together in a clump in a large barn in Mr. Fordham's farm at Pampisford. He sent me a young individual, which is preserved in my collection. It is interesting that we had not detected the species in the vicinity of the farm during previous summers. Twenty-four females and nine males of this colony were ringed by Mr. Burtsal and it is hoped that anyone finding one will communicate with the Saffron Walden Museum as requested on the ring. Up to the time of writing (1952) none of these has been recovered, so that their hibernation site remains a mystery.

***Myotis daubentonii* Kuhl. Daubenton's Bat, Water Bat.**

In 1904 Bonhote wrote (*loc. cit.*) that this species could be considered abundant

in the County. He mentioned that they could often be seen skimming low over the river near the town but that it did not appear to frequent the open fen country. It is very local in the County so that unless Bonhote was mistaken in his identification the Water Bat must have decreased in numbers since. In view of the very large number of waterways in the County I was surprised to find it so local. In July 1947, with Professor E. T. C. Spooner, Dr. E. N. Willmer and Mr. J. F. Higgins, I found a large colony at Longstowe where the lakes, surrounded almost entirely by trees, provide an ideal habitat for them. It is hard to say how many there were

Fig. 2. Natterer's Bat. Life Study by K. F. Burtsal, Esq.

but the lakes seemed to teem with them—there must have been several hundred. I obtained several specimens to confirm their identity. We have searched the River Cam from Duxford to Clayhythe looking for them and only one or two were seen by Dr. Higgins and myself in June 1948 over the river in St. John's College. The lake at Hildersham seems ideal for them but many visits there failed to reveal any—its absence is perhaps accounted for by the fact that the lake sometimes dries up during hot summers. We did not find any at Stetchworth or Hatley St. George and I have quite failed to find it in the more sheltered parts of the fen lodes and very much doubt whether it occurs there. It is thus very local now and seems to prefer areas of water almost completely sheltered by trees or buildings.

***Myotis myotis* Borkhausen. The Mouse-eared Bat.**

This continental species has been recorded on a few occasions only in Britain, one of which was a specimen taken at Girton College in 1888 and given to Dr. H. Gadow. It was identified by Bonhote (1903) and is in the University Museum. It has never been recorded in Cambridgeshire since then.

***Rhinolophus ferrum-equinum insulanus* Barrett-Hamilton. Greater Horseshoe Bat.**

***Rhinolophus hipposideros minutus* Montagu. Lesser Horseshoe Bat.**

It has been consistently stated in literature on British mammals that the Horseshoe Bats have never occurred in Cambridgeshire nor in East Anglia generally.

I was therefore astonished to find a specimen of each of these species in a jar of alcohol in the University Zoology Museum (Jar E 5603 R.) clearly labelled Girton,

Fig. 3. External Ears of the Bats found in Cambridgeshire. (*a*) Long-eared Bat (*P. auritus*) Barrington, Cams., April 28th, 1946, ♂ × 2. (*b*) Barbastelle (*B. barbastellus*) Wendens Ambo, Essex, April 10th, 1949, ♀ × 2. (*c*) Whiskered Bat (*M. mystacinus*) Matlock, Derbyshire, March 18th, 1948, ♂ × 2. (*d*) Mouse-eared Bat (*M. myotis*) Bad Segeberg, Schleswig-Holstein, March 21st, 1950, ♂ × 2. (*e*) Natterer's Bat (*M. nattereri*), Pampisford, July 1949, ♀ × 2. (*f*) Daubenton's Bat (*M. daubentonii*), Longstowe, July 23rd, 1947, ♀ × 2. (*g*) Serotine (*E. serotinus*), Shepreth, July 26th, 1947, ♂ × 2. (*h*) Noctule (*N. noctula*), Hildersham, June 6th, 1947, ♀ × 2. (*i*) Leisler's Bat (*N. leisleri*), Hildersham, May 27th, 1946, ♀ × 2. (*j*) Greater Horseshoe (*R. ferrum-equinum*), Burrington, Somerset, April 7th, 1946, ♀ × 2. (*k*) Lesser Horse-shoe (*R. hipposideros*), Burrington, Somerset, September 13th, 1947, ♂ × 2. (*l*) Pipistrelle (*P. pipistrellus*), Byron's Pool, May 19th, 1946, ♀ × 2. Drawn by the Author.

Cams., and signed by H. Gadow. A subsequent indian ink label agreed with the originals and the Director, Dr. F. R. Parrington, assured me that there is very little possibility of any confusion having occurred. There was no date on the label of

the Greater Horseshoe, but the label of the Lesser Horseshoe bore the date 1887. The general similarity of the labels suggests that the Greater Horseshoe may have been obtained about the same time. I have not been able to discover any published account of the circumstances of capture of these animals, nor have Horseshoe Bats been recorded in the County since.

The appended drawing shows the shape of the ear in all the species discussed (Fig. 3).

Acknowledgments.

I am especially indebted to Mr. K. F. Burtsal for his invaluable assistance and also for his excellent photographs (Figs. 1 and 2). I am most grateful to Dr. J. F. Higgins for his help in the field work and also to the following friends who have sent me specimens—Dr. R. H. Adrian, Dr. J. G. Harrison, Lt. A. S. McLean, R.N., A. B. Marsden-Smedley, Esq., N. W. Moore, Esq., D. E. Sergeant, Esq., Professor E. T. C. Spooner, Dr. D. Surrey Dane, and Dr. E. N. Willmer.

My special thanks are due to the Lord Lieutenant, Major R. Briscoe, M.C., D.L., for his kindness in allowing us to investigate the bats at Longstowe. I am also indebted to Lady Ellesmere and to the Hon. J. J. Astor for kindly allowing me to obtain specimens on their estates, and for their hospitality. Miss G. M. Rhodes entertained us on many occasions at Hildersham and I am most grateful to her. Dr. E. A. R. Ennion and Colonel Foster kindly sent me several interesting records. The Cambridge Natural History Society and Dr. F. R. Parrington, of the Zoology Museum, kindly allowed me to examine the collections in their care.

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FIELD NOTES

Caddis Fly new to Britain.—On June 23rd, 1950, a caddis fly was captured on the edge of Malham Tarn, which I was unable to identify. It was submitted to Mr. D. E. Kimmins, of the British Museum of Natural History, who identified it was a male *Agrypnetes crassicornis* McLachlan (Family Phryganeidae). This is a species which had previously only been recorded from Finland, N.W. Mongolia and Caucasus, and Mr. Kimmins has described and figured this addition to the British

List in the *Annals and Magazine of Natural History*, December 1952, with a revised key to the genera of this family. Several further specimens were taken round the Tarn in 1952.—P. F. Holmes.

Abundance of Antler Moth Larvae and their effect on Bird Life.—It is perhaps interesting to add some observations from Malham Moor, near Settle, to those recorded in the recent article by Mr. K. G. Spencer, (antae pp. 65-67). Larvae of the Antler Moth, *Charaeas graminis* Linn., were abnormally abundant on Malham Moor during the summer of 1948 and to a lesser extent in 1949, though they never constituted a plague. I only came to live at Malham Tarn in April of 1948, and so did not realise in that year that the gulls present were unusual.

Thirty Lesser Black-backed Gulls were noted on June 4th, 1948, over 100 circling round the Tarn on June 15th, and many on the uplands between the Tarn and Kilnsey on July 1st. During 1949 numbers of this species started to appear at the beginning of June, and on the 14th over 300 were counted flying in to roost on the Tarn from the north-east between 17.53 and 18.35 hours, at least 75 per cent. immatures. Lesser Black-back pellets collected on June 19th were composed almost entirely of Antler Moth larval skins.

Curlew also were feeding during both these years extensively on larvae, pupae and adults of the Antler Moth. Nine pellets analysed on July 13th, for example, consisted of 40 per cent. pupal cases and 8 per cent. larval skins by bulk; while most pellets in August contained eggs of the adult Antler Moth.—P. F. Holmes.

An Eyeless Daphnia and a Note on Its Progeny.—Among a collection of numerous specimens of the Cladoceran *Daphnia pulex* (de Geer) taken from a pond situated between Aberford and Sherburn-in-Elmet (V.C. 64) in August, 1950, was a single individual which exhibited the peculiar condition of being devoid of a compound eye. In spite of this disability the specimen appeared to be in no way inconvenienced and had a number of well-developed embryos in its brood pouch. Although the eye was absent, eye muscles were present and were apparently attached, at what would normally be the point of attachment with the eye, to what appeared to be a delicate curved membrane attached to which were two small objects which probably represented the remains of lenses. Two other hyaline objects present near the rostrum appeared to be lenses which had drifted from their usual position, but no sign of injury or disease which may have been responsible for this was noticed.

Since finding this specimen I have seen a note by D. J. Scourfield (*J. Quekett Micr. Cl.*, Ser. 4, **2**, 1945, 97) in which he describes the finding of eyeless specimens of *Daphnia magna* Straus. and in which he emphasises the rareness of such finds and states that the only other reference to this phenomenon appears to be an article by A. M. Banta (*Science*, **53,** 1921, 462) who describes an eyeless individual of *Simocephalus* sp. Scourfield draws particular attention to the fact that in both his own case and that of Banta nothing was known of the progeny of these individuals and he specially states that it is desirable to know whether or not the eyeless condition is inherited. Fortunately this question can be answered in the case of the specimen at present under consideration for I have a note to the effect that the well-developed embryos in the brood pouch showed a well-marked development of the compound eye and unless degeneration set in just before parturition—which seems highly unlikely—they were evidently destined to be perfectly normal in this respect.

Banta and Scourfield were interested in determining the inheritability or otherwise of the eyeless condition particularly from the point of view of throwing light on the possible origin of eyeless cave animals as the result of a single mutation. In the case of the specimen here considered it is possible to demonstrate conclusively that the eyeless condition was not due to a genetical mutation. The embryonic young were produced as a result of parthenogenetic reproduction and not as the products of syngamy and must therefore have had a genetical constitution identical with that of the parent. As they were perfectly normal from the point of view of the possession of a compound eye it is obvious that the parent was potentially, if not actually, normal also, and that its eyeless condition was the result not of a genetic mutation but of some accident or disease even though no evidence of such a causal agent was observed.—G. Fryer.

PODOCONIS IN BRITAIN

S. J. HUGHES

Summary: Three species of *Podoconis* are considered to occur in Britain, of which two are described as new.

The generic name *Podoconis* was published by Boedijn in 1933 for two species from Sumatra and Java, *P. theae* (Bern.) Boed. (≡*Helminthosporium theae* Bern.) and *P. megasperma* Boed. with the following diagnosis: 'Mycelium fuscum, ramosum, septatum. Conidiophoris fuscis, filiformibus, simplicibus, septatis. Conidiis solitarie apicalibus, fuscis, crasse fusoideis vel obclavatis, septatis, basi breviter attenuatis et crasse tunicatis, apice in pedicello subhyalino attenuatis, loculis basilaribus vel secundis vel duobus inferioribus quam ceteris multo majoribus.'

From a study of British collections preserved in Herb. I.M.I. and Herb. R.B.G. Kew it is considered that there are three species which can be classified in this genus which is recorded for the first time in Britain. One is *Helminthosporium altum* Preuss (syn. *H. turbinatum* Berk. & Br.) and two are described as new.

Recent collections from Sierra Leone, the Gold Coast and Togoland suggest that at least four other species occur in that region.

An attempt has been made to find a suitable generic name earlier than *Podoconis* for these species but without success. However, perhaps the generic name *Oxysporium* Léveillé (1863), based on *O. armatum* Lév. may be an earlier synonym. Berlese & Saccardo (1892) considered *O. armatum* to be a *Helminthosporium* and compiled it as *H. armatum*. Léveillé's diagnosis of his species is certainly suggestive of a *Podoconis*: 'Hyphis setiformibus, gregariis, nigris, erectis, rigidis, simplicibus, continuis; conidiis 2- 4-locularibus, levibus, acumine inani, lanceolatis, basi adfixis, apice liberis'; it was found on rotten wood in Colombia. No material of this species is preserved under this name in Herb. Mus. Nat. Paris and as far as I am aware the fungus has not been redescribed under this name.

(1) ***Podoconis alta*** (Preuss) Mason & Hughes comb. nov.

≡*Helminthosporium altum* Preuss in Sturm's *Deutschlands Flora*, Band 6, p. 33, 1848.

≡*Brachysporium altum* (Preuss) Sacc. in *Sylloge Fungorum*, iv, p. 425, 1886.

=*Helminthosporium turbinatum* Berk. & Br. in *Ann. Mag. Nat. Hist.*, Ser. 2, vii, p. 98, 1851.

Colonies effuse, black, usually staining the woody substratum green.

Mycelium immersed, composed of subhyaline to brown, septate, branched hyphae.

Conidiophores sparse or crowded, usually arising solitarily or in small groups, simple, erect, septate, thick-walled, dark brown, up to 500μ long, 4·5 to 6μ wide just above the base which is swollen up to 8μ wide, 4·5 to 5μ wide at the apex.

Conidia develop singly and successively as blown-out ends of conidiophores and of their successive cylindric-obclavate proliferations through the old conidial scars; they are 5- to 8-(mostly 6- to 7-)septate, obclavate, basally turbinate, smooth, with the basal cell longest and the upper cells successively shorter towards the apex, with the basal or sub-basal cell widest; they are brown to almost black except the apical one or two cells which are pale brown to subhyaline; they measure 40 to 68 by 12 to 19 (mostly 45 to 55 by 14 to 17)μ.

Habitat: on dead wood and bark of *Acer pseudoplatanus*, *Buxus sempervirens*, *Hedera helix*, *Prunus avium*, and especially *Sambucus nigra*, and on dead stems of *Epilobium angustifolium*.

Collections examined: on *Acer*, Yorks., 9/4/1948, Herb. I.M.I. 27650 (S.J.H.); on *Buxus*, Surrey, 13/4/1946, 4495; 19/1/1947, 10879 (S.J.H.); on *Epilobium*, Yorks., 25/9/1950, Herb. Univ. Sheffield, 987 (W.G.B.); on *Hedera*, Yorks., 4/1949, Herb. Univ. Hull, 936 (J.W.); on *Prunus*, Yorks., 26/9/1948, Herb. I.M.I. 31482 (J.W.); on *Sambucus*, Cards., 26/3/1948, 27366, 27375 (S.J.H.); Cornwall, 21/5/1947, 15415 (F.R.); Notts., 3/10/1947, 13909 (J.W.); 3/10/1948, 32057; Yorks., 13/9/1946,

6800 (S.J.H.); 13/4/1947, 13809; 11/10/1947, 19253(a); 12/10/1947, 19258(b) (E.W.M. & S.J.H.); 25/9/1948, 31517 (S.J.H.); 14/4/1950, 40673, 40675.

There are also collections of *P. alta* in Herb. I.M.I. on *Sambucus* from Eire and Guernsey and on *Ulmus* from Northern Ireland.

Preuss (*loc. cit.*) described and illustrated his species from a collection on the wood of *Juglans regia*.

Podoconis alta is illustrated in Fig. 1.

British Records of Brachysporium altum (*Preuss*) *Sacc.*

Berkeley & Broome (1861) introduced the name *Helminthosporium altum* Preuss into British literature and cited a collection ' On dead sticks. Twycross, Rev. A. Bloxam '. The only collection in the *Brachysporium altum* folder in Herb. R.B.G.

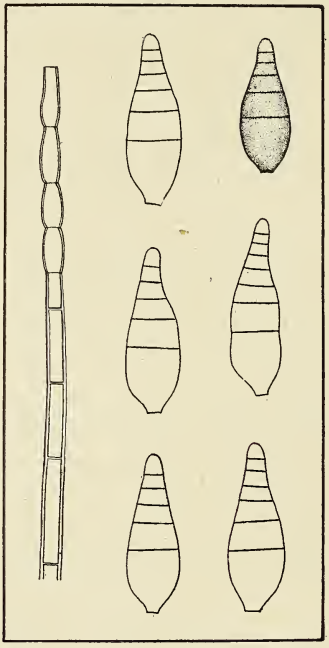

Fig. 1.—***Podoconis alta*** conidiophore and conidia from Herb. I.M.I. 13809 ; × 500.

Kew is labelled *Helminthosporium altum* by Berkeley but its source is not indicated; it bears what is here considered to be *Podoconis alta* (syn. *Helminthosporium turbinatum* Berk. & Br.).

Cooke (1871, p. 574) compiled Berkeley & Broome's record.

Cooke (1888) recorded *Brachysporium altum* ' on Walnut wood. Twycross '.

Massee (1893, p. 413) compiled *B. altum*.

British Records of Helminthosporium turbinatum *Berk. & Br.*

Berkeley & Broome (1851) described their new species and the type collection is preserved in Herb. R.B.G. Kew; it was found in Lancashire in July 1840 and is here considered to be based on *Podoconis alta*.

Cooke (1871, p. 572) compiled the original record.

Bucknall (1878) recorded the fungus from Leigh Wood, April 1877; his mycological herbarium has been destroyed.

Cooke (1888) compiled the original record.

Massee (1893, p. 411) compiled the species but described the conidia as 21 to 26 by 14 to 15μ which is much too short for this fungus. This appears to be the first time that the dimensions of the conidia were given.

Helminthosporium turbinatum was not again recorded for Britain until 1947 and then repeatedly afterwards in *Naturalist, Lond.* following mycological forays of the Yorkshire Naturalists' Union. Most of the collections therein recorded are preserved in Herb. I.M.I. with some in Herb. Univ. Hull and Herb. Univ. Sheffield. A check list of the Yorkshire records and the collections upon which they are based is given here.

1947 (*Naturalist, Lond.*, p. 90) Herb. I.M.I. 6800 and 7334; 1947 (*op. cit.*, p. 162) Herb. I.M.I. 13809; 1948 (*op. cit.*, p. 79) Herb. I.M.I. 19253(a) and 19258(b); 1949 (*op. cit.*, p. 12) Herb. I.M.I. 27650; 1949 (*op. cit.*, p. 159) Herb. Univ. Hull 964 and 939; 1950 (*op. cit.*, p. 164) Herb. I.M.I. 40673; 1951 (*op. cit.*, p. 91) Herb. Univ. Sheffield 987.

The collections preserved in Herb. Univ. Hull and Herb. Univ. Sheffield were borrowed through the kindness of Professor R. D'O. Good and Mr. J. Webster.

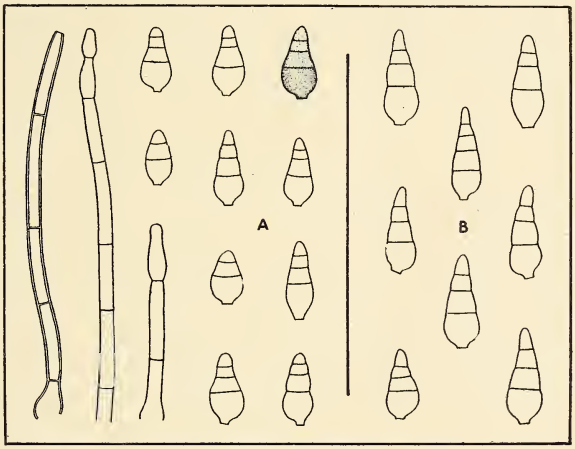

Fig. 2.—***Podoconis cookei:*** conidiophores and conidia; **A,** from Herb. I.M.I. 31692; **B,** from Herb. I.M.I. 392; × 500.

All the collections cited above are now considered best disposed as *Podoconis alta* (Preuss) Mason & Hughes.

(2) ***Podoconis cookei*** Hughes sp. nov.

Coloniae effusae, atrae.

Mycelium immersum, ex hyphis subhyalinis vel brunneis, ramosis, septatis compositum.

Conidiophora erecta, simplicia, septata, crasso-tunicata, usque ad 220μ longa, basi inflata (ad 8μ) dein 4-5μ, apice 3-4μ crassa; apice per proliferationes successivas subcylindricas elongascentia.

Conidia singularia, primo in apice ipso conidiophori et dein successive proliferationis cujusque ultimae oriunda, 3-5 (plerumque 3- 4-, raro 5-)-septata, ad septa non vel vix constricta, obclavata, basi fortiter turbinata, laevia vel sub-laevia, apice attenuata, 17-30 × 7-12μ (plerumque 18-25 × 8-9μ); cellulis basalibus 1 vel 2 brunneis vel atrobrunneis, cellulis apicalibus successive minoribus pallidioribusque.

Habitat in ramis emortuis *Clematidis* [? *vitalbae*] (Herb. M. C. Cooke in Herb. R.B.G. Kew sub *Helminthosporio parvo* Grove), Darenth, Scotia, 4/1875; in ligno corticeque emortuo *Sambuci nigrae*, Perranzabuloe, Cornwall, Anglia, 26/1/1952, Herb. I.M.I. 48592 and 49472 (F.R.); Blenheim Park, Oxfordshire, Anglia, 15/9/1949, Herb. I.M.I. 37721 (M.B. & J.P.E.); Moulin Huet, Guernsey, 25/9/1948, Herb. I.M.I. 31692 (M.B. & J.P.E.) (typus); Shiplake, Anglia, 11/5/1947, Herb. I.M.I. 15240 (P.H.B.T.); in ramis emortuis (? *Sambuci nigrae*), Southerndown, Cambria,

8/3/1945, Herb. I.M.I. 392 (S.J.H.); in caulibus emortuis *Eupatorii cannabini*, Moulin Huet, Guernsey, 19/9/1948, Herb. I.M.I. 34190(b) (M.B. & J.P.E.).

Colonies effuse, black.

Mycelium immersed, composed of subhyaline to brown, septate, branched hyphae.

Conidiophores sparse or crowded, usually arising solitarily, simple, erect, septate, thick-walled, dark brown, up to 220μ long, 4 to 5μ wide just above the base which is swollen up to 8μ wide, 3 to 4μ wide at the apex.

Conidia develop singly as blown-out ends of conidiophores and of their successive proliferations through the old conidial scars; they are 3- to 5-(mostly 3- to 4-, rarely 5-)septate, obclavate, basally turbinate, smooth or rarely roughened, with the basal cell longest and widest, the basal one or two cells darkest, with the upper cells successively paler towards the rounded apex; they measure 17 to 30 by 7 to 12 (mostly 18 to 25 by 8 to 9)μ.

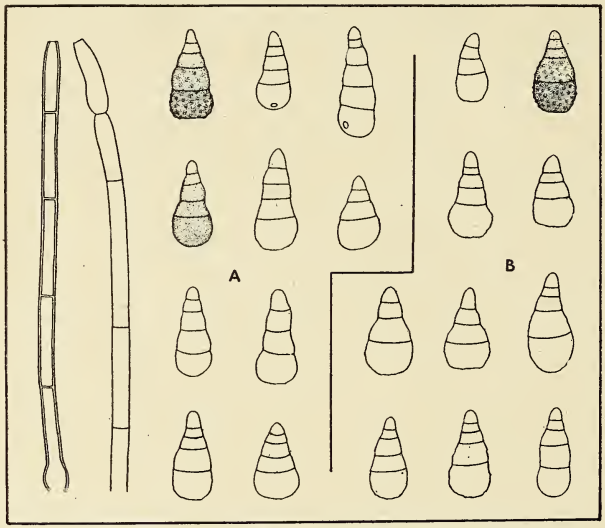

Fig. 3.—***Podoconis aturbinata:*** conidiophores and conidia; **A,** from Herb. I.M.I. 40674; **B,** from Herb. I.M.I. 48419 × 500.

Habitat on dead branches of *Clematis* and *Sambucus nigra* and the dead stems of *Eupatorium cannabinum* in England, Wales, Scotland and Guernsey.

The fungus is illustrated in Fig 2.

A British Record of Helminthosporium parvum *Grove*

Grove described and figured his new species in 1886; the conidia measure 12 to 15 by 5 to 6μ, are 3-celled with the central cell inflated and brown and the narrower end cells paler. I have not seen a collection referable to this name, but from the description alone the fungus is distinct from *Podoconis*.

Cooke (1888) compiled Grove's original record and listed as *Helminthosporium parvum* another collection from Darenth; the last named collection is preserved in Herb. R.B.G. Kew. It is on *Clematis* from Darenth, April 1875, and assigned apparently by Grove to *H. parvum*. The collection bears *Podoconis cookei*.

Massee (1893, p. 406) compiled the original record.

(3) ***Podoconis aturbinata*** Hughes sp. nov.

Coloniae effusae, atrae.

Mycelium immersum, ex hyphis subhyalinis vel pallide-brunneis, ramosis, septatis compositum.

Conidiophora erecta, simplicia, septata, atrobrunnea, crasso-tunicata, usque ad 250μ longa, basi inflata (ad 9μ) dein 4-5μ, apice 3-4μ crassa; apice per proliferationes successivas subcylindricas elongascentia.

Conidia singularia, primo in apice ipso conidiophori et dein successive proliferationis cujusque ultimae oriunda, 3-4 (plerumque 3-)-septata, ad septa subconstricta, pyriformia, basi rotundata vel plana, rarissime paulo turbinata, plerumque verruculosa, apice attenuata, 18-24 × 9·5-13 (plerumque 20-22 × 10-12)μ; cellula basali majore, brunnea vel atrobrunnea, cellulis apicalibus successive minoribus pallidioribusque.

Habitat in ligno emortuo *Sambuci nigrae*, prope Masham, Yorkshire, Anglia, 15/4/1950, Herb. I.M.I. 40674 (typus); in culmis emortuis *Ammophilae arenariae*, 'North Bull Island,' Dublin, Eire, 20/8/1951, Herb. I.M.I. 48419 (F.C.H.).

Colonies effuse, black.

Mycelium immersed, composed of subhyaline to brown, septate, branched hyphae.

Conidiophores sparse or crowded, arising solitarily or in a group of up to six from small aggregations of cells, simple, erect, septate, thick-walled, dark brown, up to 250μ long, 4 to 5μ wide just above the swollen base which is up to 9μ wide, 3 to 4μ wide at the apex.

Conidia develop singly as blown-out ends of conidiophores and of their successive proliferations through the old conidial scars; they are 3- to 4-(mostly 3-)septate, slightly constricted at the septa, pyriform, basally rounded or even flattened, very rarely sub-turbinate, generally warted below, with the basal cell wider, darker, and usually longer than the upper cells which are successively paler towards the rounded apex; they measure 18 to 24 by 9·5 to 13 (mostly 20 to 22 by 10 to 12)μ.

Habitat: on rotten wood of *Sambucus nigra* and dead stems of *Ammophila arenaria*, England and Eire.

The fungus is illustrated in Fig. 3.

I wish to thank Mr. E. W. Mason for correcting the Latin diagnoses.

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The **Eleventh International Ornithological Congress,** presided over by Sir Landsborough Thomson, London, will be held in Basel (Switzerland) from May 29th to June 5th, 1954.

During the week of the Congress, five days will be devoted to meetings and two to excursions. Before and after the Congress (May 25th-28th and June 7th-19th) excursions will be arranged to enable members to become acquainted with the Swiss avifauna, especially of the Alps and Lower Alps. The Congress fee is 30 Swiss francs.

The prospectus, containing registration form and detailed information, will be distributed this summer. Applications to attend, and to contribute scientific papers, should be sent in before February 28th, 1954, and addressed to:

XI. International Ornithological Congress,
Zoological Garden, Basel/Switzerland,

which is at disposal for any inquiries needed.

Coleoptera Notes.—The following notes cover some of my best captures during the years 1951 and 1952. All the localities mentioned are within the boundaries of V.C. 64. Included are several species listed in *A Practical Handbook of British Beetles* (N. H. Joy, 1932) as being ' Very Local ', ' Rare ' or ' Very Rare '. In one case (*Euophryum rufum* Broun), the beetle has only seven previous records for the whole country (six from the London Area and one from Glasgow). The species are listed below, viz.:

Carabidae. *Feronia caerulescens* L. Scarcroft, near Leeds, one specimen only, 3/5/51. A further search of the area in 1952 led to the discovery of small numbers of this beetle in some very wet pasture land near the (now non-existent) Scarcroft Fish Pond.

Staphylinidae. *Siagonium quadricorne* Kirby. Both sexes in abundance under dead elder bark, in two localities about one-third mile apart at Scarcroft, near Leeds, 14/11/51. Roundhay Lime Hills used to be the only known locality in the Leeds Area for this beetle. It has since turned up in quantities at Shire Oak Wood, Tadcaster.

Rhipiphoridae. *Metoecus paradoxus* L. Scarcroft, near Leeds, one specimen only, 27/8/52. This interesting beetle does not appear to have been recorded from V.C. 64 for a number of years.

Brachyderinae. *Barypithes pellucidus* Boh. Scarcroft, near Leeds, one specimen, 12/7/51. Is occasionally a pest on young grafted trees.

Barynotus squamosus Germar v. *schönherri* Zett. Kex Ghyll, Beamsley, near Ilkley, one specimen, 6/5/51. This appears to be the rarest of the three species of *Barynotus*.

Cossoninae. *Euophryum rufum* Broun (Conf. F. D. Buck). Two specimens from decayed oak logs, Leeds, 4/4/52. I am indebted to Mr. H. Whitehead for the opportunity of taking this beetle. Two further specimens were taken by Mr. D. W. Whitehead on January 4th, 1953. This beetle is a native of New Zealand, where it was first described by Broun from two specimens taken near Whangarei Harbour. (See Buck, R. D., *Pentarthrum huttoni* Woll. (Col. Curculionidae) and some imported Cossoninae, *Ent. mon. Mag.*, **84,** 152; 1948.)

Hylobiinae. *Alophus triguttatus* Fab. Kex Ghyll, Beamsley, near Ilkley, one specimen, 6/5/51.

Scolytidae. *Scolytus mali* Bech. Scarcroft, near Leeds, one specimen, 12/7/51. Occasionally a pest on fruit trees.—H. M. Russell.

EIGHTH ANNUAL CONGRESS OF BRITISH ENTOMOLOGISTS

At the invitation of the Entomological Section of the Yorkshire Naturalists' Union this Congress, organised by the Society for British Entomology, will be held in Leeds, July 10th to 13th, 1953. Lectures, etc., will be held in the University of Leeds (by kind permission of the Vice-Chancellor) and visitors from a distance will be accommodated at the Weetwood Hall of Residence at an inclusive charge of £3 2*s.* 6*d.* from Friday dinner to Monday lunch.

On the Sunday a Field Meeting will be held at Askham Bog, York (a famous fenland with a rich and varied fauna) and provision is made for the ladies to look round the ancient city of York. On Monday morning a visit will be paid to the Orchid nurseries of Messrs. Mansell & Hatcher Ltd., Rawdon.

The proceedings will open with an Address of welcome by Professor E. A. Spaul, University of Leeds. Amongst the lectures down for reading are: The Presidential Address by Dr. W. H. Thorpe on ' Plastron Respiration. A Chapter in the natural history of aquatic insects '; Dr. H. E. Hinton on ' Some adaptations of insects to environments which are alternately dry and flooded '; Dr. T. T. Macan on ' The natural history of some stream-living Ephemeroptera '; Dr. H. Henson on ' The Antennae of insects '; Mr. H. Hayhurst on ' Entomological Problems in Warehouses '; Mr. G. S. Kloet on ' Drawing conclusions '.

Entomologists wishing to receive a Programme of the Congress should send name and address to Mr. W. D. Hincks, Hon. Organiser, University Museum, Manchester 13, or to Mr. S. C. S. Brown, Hon. Secretary, Society for British Entomology, 454 Christchurch Road, Bournemouth, Hants. These Congresses are open to all persons, of either sex, who are interested in British entomology.

((*Continued from* 1952, *page* 176)

9—COLEOPTERA, STAPHYLINIDAE (*concluded*)

Philonthus politus (Linnaeus) PH., 6/50, a few exx. in reed debris and in stable refuse.
P. sanguinolentus (Gravenhorst) PH., M.M., in dung; W., F., S., in carrion; common.
P. rectangulus Sharp, F., S., in carrion, not common.
P. cognatus Stephens (=*fuscipennis* (Mannerheim)) M.R., 23/6/51, a few exx. at roots of vegetation in a sheltered place.
P. varius (Gyllenhal) W., F., S., in carrion; F., in tidal refuse; not common.
P. longicornis Stephens PH., M.M., in dung; F., S., in carrion; common.
P. varians (Paykull) as *longicornis*, generally in company with this.
P. cruentatus (Gmelin) S.M., 19/6/51, amongst rabbit droppings, 1 ex.
P. albipes (Gravenhorst) PH., 6/50, a few exx. in horse dung.
P. cephalotes (Gravenhorst) PH., in stable refuse and reed debris; not common.
P. pachycephalus Nordmann (=*sordidus* (Gravenhorst)) M.M., in straw heap; PH., in straw heap and stable refuse, also in reed debris; S.M., amongst rabbit droppings; not uncommon.
P. quisquilarius (Gyllenhal) F., in tidal refuse, occasional specimens; PH., in reed debris, usually uncommon, but rather abundant in 7/48.
P. umbratilis (Gravenhorst) PH., in stable refuse, not uncommon in 6/50, much less common in 6/51 and 7/52.
P. marginatus (Strøm) M.M., 6/51, in dung, common; none seen prior to this time or in 7/52.
Gabrius nigritulus (Gravenhorst) M.M., in straw refuse; M.S.; wet places on sea cliffs; W., M.R., at grass roots; common.
G. pennatus Sharp, PH., not uncommon in reed debris.
Cafius xantholoma (Gravenhorst) F., adults and larvae widespread and abundant in tidal refuse and carrion; S., only occasional adults seen. Often flies to light.
Staphylinus stercorarius Olivier, W., 7/52, under stone, 1 ex.
Ocypus olens (Müller) W., under stones, etc., not uncommon.
O. ater (Gravenhorst) F., adults and larvae common and widespread under tidal refuse, particularly in the chalk bank area near S.M. Larvae also found at roots of marram. [Welwick, common in salt marsh].
O. globulifer (Fourcroy) (=*siculus* (Stierlin)) W., under stones, etc., not uncommon; PH., in reed debris, occasional specimens. [Welwick, 20/6/47, in salt marsh, 2 exx.].
O. winkleri (Bernhauer) W., under stones, etc., occasional specimens.
O. melanarius (Heer) (=*globulifer* auctt.) W., F., under stones, etc., occasional specimens.
O. brunnipes (Fabricius) W., 18/7/48, 1 ex., 6/51, 1 ex., under stones.
O. aeneocephalus (De Geer) W., 14/8/49, 1 ex., 7/52, 1 ex., under stones.
Ontholestes murinus (Linnaeus) M.M., PH., in dung; F., S., W., in carrion; common.
Creophilus maxillosus (Linnaeus) F., S., W., PH., in carrion, sometimes abundant.
Heterothops binotatus (Gravenhorst) F., common and widespread in tidal refuse.
Quedius laevicollis (Brullé) (=*tristis* (Gravenhorst)) W., under stones, etc., not uncommon.
Q. fuliginosus (Gravenhorst) P.M.M., 10/6/50, on bank of pond, 1 ex.; PH., 14/7/52, in reed debris, 1 ex.
Q. molochinus (Gravenhorst) W., under stones, etc.; PH., at grass roots; M.S., at roots of marram; S.M., in moss; M.R., at roots of vegetation in a sheltered place, not uncommon. [L.B.D., in reed debris.]
Q. pallipes Lucas F., common in tidal refuse in the chalk bank area near S.M.; occasional specimens taken on sea cliffs (flying on) and on the banks of P.P.A.
Q. mesomelinus (Marsham) PH., 9/6/50, 1 ex., 15/7/52, 1 ex., in debris.
Q. cinctus (Paykull) M.H., occasional specimens at marram roots.
Q. semiobscurus (Marsham) (=*rufipes* (Gravenhorst)) not uncommon over most of the area in debris of various kinds and at roots of vegetation; very common in grass tufts, W., 8/49.
Q. semiaeneus (Stephens) W., 15/8/49, in grass tuft, 1 ex.; S.M., 10/6/50, in moss, 1 ex.
Q. schatzmayri Gridelli W., 8/49, in grass tufts, not common; PH., 6/50, in stable refuse, occasional specimens.

Q. aridulus Jansson S.M., not uncommon in moss and at roots of vegetation, also in tidal refuse near chalk bank.
Q. arestor Tottenham PH., 20/8/49, in reed debris, 1 ex.
Q. sp. M.H., W., PH., not uncommon in debris and at roots of vegetation.

This species, which belongs to the ' *boops* ' group of *Quedius*, does not appear to be amongst those dealt with by Tottenham (*Ent. mon. Mag.*, **84**: 1948, 241-258) and may be new.

Quedius obliteratus Erichson W., PH., S.M., occasional specimens at roots of vegetation; common in grass tufts, W., 8/49.
Q. maurorufus (Gravenhorst) PH., 21/7/48, in reed debris, 1 ex.; P.M.M., 10/6/50, on bank of pond, 1 ex.
Q. scintillans (Gravenhorst) PH., 8/6/50, in stable refuse, 1 ex.

TACHYPORINAE

The beetles of this subfamily appear to be mainly predaceous, both as adults and larvae. The larvae of some species of *Tachyporus*, however, have been reared entirely on a vegetable diet.

Mycetoporus splendidus (Gravenhorst) M.M., in straw heap; PH., in stable refuse and straw heap; W., at roots of vegetation in sheltered places; S.M., in moss; not uncommon.
M. lepidus (Gravenhorst) M.H., 15/6/47, at marram roots, 2 exx.
M. piceolus Rey W., 17/6/51, at roots of vegetation in a sheltered place, 1 ex.; wet place on sea cliffs, 17/6/51, 1 ex., 12/7/52, 1 ex. *Piceolus* Rey may only be a light coloured variety of *M. baudueri* Muls. and Rey, but this has yet to be proved.
Bryocharis analis (Paykull) W., 22/6/51, at roots of vegetation in a sheltered place, 1 adult and 1 larva.
Conosomus testaceus (Fabricius) not uncommon over most of the area, under stones, at roots of vegetation, etc.
C. immaculatus (Stephens) W., at roots of vegetation, 8/6/50, 1 ex., 20/6/51, 1 ex.
C. lividus (Erichson) common at roots of vegetation over most of the area; PH., D., common in debris.
Tachyporus chrysomelinus (Linnaeus) PH., in reed debris, common; M.M., in straw heap, common; F., not uncommon in tidal refuse; occasional specimens in most other parts of the area. (L.B.D., common in debris.)
T. pallidus Sahlberg PH., not uncommon in reed debris. (L.B.D., in reed debris.)
T. hypnorum (Fabricius) occurs fairly commonly over most of the area, often taken by sweeping. (L.B.D., in reed debris; Welwick, in debris; Kilnsea saltings, in debris.)
T. solutus Erichson, not common, occurs sparingly in reed debris in PH., a few exx. taken elsewhere.
T. obtusus (Linnaeus) occurs over most of the area, particularly W., PH. and M.H. (Kilnsea saltings, in debris; Welwick, in salt marsh.)
T. atriceps Stephens PH., in reed debris, not common.
T. pusillus Gravenhorst W., occasional specimens at roots of vegetation and under stones, etc.
T. nitidulus (Fabricius), the commonest species of the genus at Spurn; occurs practically everywhere, even in dry, sandy areas.
Lamprinodes saginatus (Gravenhorst), on sea cliffs, 17/6/51, 1 ex.
Tachinus signatus Gravenhorst (=*rufipes* (De Geer)) D., at roots of vegetation; M.M., in straw heap; a few exx. only.
T. marginellus (Fabricius) PH., in debris; D., at roots of vegetation; M.M., in straw heap; not common.
Cilea silphoides (Linnaeus) F., S., in carrion; PH., in horse dung; common at times.
Cypha longicornis (Paykull) W., in grass tufts and at roots of vegetation; M.M., at grass roots and by sweeping; F., in tidal refuse near S.M.; (L.B.D., at roots of vegetation).
C. laeviuscula (Mannerheim) D., 22/7/48, at roots of vegetation, 1 ex.

ALEOCHARINAE

This is by far the largest subfamily of British *Staphylinidae* and practically nothing is known regarding the habits of the majority of the species. Some, such as *Drusilla canaliculata* (Fab.) and *Oligota* spp., are predaceous both as larvae and

adults whilst others appear to be saprophagous or, possibly, phytophagous. The species of *Aleochara* are, in the larval stage, obligate parasites of the puparia of various species of Diptera; the adults appear to be predaceous.

Diglotta sp. F., adults and larvae common under stones below high-water mark, particularly near S.M. This species is the larger of the two British *Diglotta* and, at least at Spurn, does not appear to have a fully winged form. There is some confusion with regard to the nomenclature of the European species of the genus and the trivial name is omitted for the present.

Oligota ytenensis Sharp M.M., in cow dung, not uncommon; PH., common in stable refuse; W., sometimes common in grass tufts; occasional specimens elsewhere. The Spurn exx. agree with the type of *ytenensis*, but this may only be a short winged form of *pusillima* (Gravenhorst). Although a large number of Spurn exx. (30-40) have been examined, no fully winged specimens have been seen.

O. atomaria Erichson S.M., in tidal refuse, 20/7/48, 2 exx., 13/8/49, 1 ex.

O. inflata (Mannerheim) M.M., in straw heap; PH., in stable refuse; S.M., in tidal refuse; common. W., occasional specimens.

Phytosus spinifer Curtis, at base of sea cliffs near S.M., 14/7/52, 1 ex.

P. balticus Kraatz F., under seaweed, etc., occasional specimens only.

Autalia rivularis (Gravenhorst) PH., in horse dung and stable refuse; M.M., in cow dung; common.

Myrmecopora sulcata (Kiesenwetter) F., common, at times abundant, under stones, particularly near W.; S., common at times under stones. Apart from carrion species, this is the only Staphylinid that has been taken in any numbers on the seashore.

Gnypeta carbonaria (Mannerheim), banks of pond on Humber shore, 6/51, not uncommon; wet places on sea cliffs, 6/51 and 7/52, a few exx. (Kilnsea saltings, common on mud; pond near Long Bank Dyke, common.) This species was not taken within the area until 6/51, though it was found outside (L.B.D. area) prior to this.

G. rubrior Tottenham S.M., 17/8/49, on mud, 1 ex.

Amischa analis (Gravenhorst) F., under tidal refuse; D., in debris; PH., in reed debris; W., in grass tufts and at roots of vegetation; not uncommon. Occasional specimens elsewhere. (L.B.D., in debris; Kilnsea saltings, on mud.)

A. decipiens (Sharp), as widely distributed as *analis*, in company with which it is usually found, but less common. (Kilnsea saltings, on mud.)

Sipalia circellaris (Gravenhorst) PH., D., at roots of vegetation and in debris, occasional specimens only.

Atheta (*Dilacra*) *luteipes* (Erichson) PH., in reed debris, not uncommon in 7/48, but distinctly rare in 49–51. No specimens seen in 7/52.

A. (*Dacrila*) *fallax* (Kraatz) PH., in reed debris, abundant in 7/48, much less common during the other visits. Occasional specimens in other parts of the area.

A. (*Aloconota*) *gregaria* (Erichson) F., in tidal refuse; PH., D., at roots of vegetation and in debris; M.H.; W., at roots of vegetation and in grass tufts; occasional specimens elsewhere; common. (Welwick, at roots of vegetation in salt marsh.)

A. (*Brundinia*) *meridionalis* (Mulsant and Rey) F., widely distributed and not uncommon in tidal refuse, particularly near S.M.; sea cliffs, occasional specimens in wet places.

A. (*B.*) *marina* (Mulsant and Rey). In similar situations to *meridionalis*, but less common. (Kilnsea saltings, 6/50, common on mud; Welwick, in salt marsh, not common.)

A. (*Philhygra*) *palustris* (Kiesenwetter) F., in carrion, not common; W., in grass tufts, common at times; M.M., in straw heap, not common; wet places on sea cliffs, very common at times; occasional specimens elsewhere.

A. (*P.*) *luridipennis* (Mannerheim), wet place on sea cliff, 12/7/52, 1 ex.

A. (*P.*) *hygrotopora* (Kraatz), wet places on sea cliffs, 21/6/51, 1 ex., 12/7/52, 1 ex.

A. (*P.*) *elongatula* (Gravenhorst) PH., 20/8/49, in reed debris, 2 exx.; wet places on sea cliffs, 7/52; a few exx.

A. (*P.*) *halophila* (Thomson) (=*tomlini* Joy) PH., 20/8/49, in reed debris, 1 ex.

A. (*Microdota*) *amicula* (Stephens) M.M., 17/6/47, at roots of grass, 1 ex.; F., 22/7/48, in tidal refuse, 1 ex.

A. (*M.*) *atricolor* (Sharp) P.P.A., 5/6/50, on bank of pond, 1 ex.

A. (*M.*) *indubia* (Sharp) W., 24/7/48, in nest of vole, 1 ex.; F., 17/7/52, on sand, 1 ex.

A. (*Tetropla*) *xanthopus* (Thomson) W., 16/8/49, in grass tuft, 1 ex.
A. (*T.*) *trinotata* (Kraatz) F., not uncommon in tidal refuse; W., in grass tufts, not common; M.M., PH., common in straw heaps; wet places on sea cliffs, occasional specimens.
A. (*T.*) *triangulum* (Kraatz) F., in tidal refuse, occasional specimens only.
A. (*Stethusa*) *pertyi* (Heer), wet place on sea cliff, 8/6/50, 1 ex.
A. (*s. str.*) *graminicola* (Gravenhorst) PH., in reed debris, occasional specimens.
A. (*Thinobaena*) *vestita* (Gravenhorst) F., in tidal refuse, particularly in the chalk bank area near S.M., usually common. (Welwick, in salt marsh, 8/49.)
A. (*Dimetrota*) *setigera* (Sharp) M.M., in dung, 7/48, a few exx.
A. (*D.*) *nigripes* (Thomson) PH., in reed debris; M.M., in cow dung; not common.
A. (*D.*) *atramentaria* (Gyllenhal) PH., M.M., common, at times abundant in dung; F., S., not uncommon in carrion: occasional specimens elsewhere.
A. (*Badura*) *cauta* (Erichson) PH., M.M., a few exx. in dung; occasional specimens elsewhere.
A. (*B.*) *ischnocera* Thomson PH., not uncommon in horse dung.
A. (*B.*) *macrocera* (Thomson) M.M., 22/7/48, in cow dung, 1 ex.
A. (*Datomicra*) *sordidula* (Erichson) M.M., common in cow dung.
A. (*D.*) *nigra* (Kraatz) (=*zosterae* auctt. Brit.) F., common in tidal refuse; M.M., common in dung and straw heap; occasional specimens elsewhere.
A. (*Chaetida*) *longicornis* (Gravenhorst) M.M., PH., common in dung; F., S., common in carrion.
A. (*Coprothassa*) *melanaria* (Mannerheim) PH., a few exx. in horse dung, June 1950.
A. (*C.*) *sordida* (Marsham) F., in tidal refuse; M.M., PH., in dung; W., in grass tufts; common. Occasional specimens elsewhere.
A. (*Acrotona*) *parvula* (Mannerheim) (=*parva* (Sahlberg)) M.M., PH., not uncommon in dung; F., occasional specimens in tidal refuse.
A. (*A.*) *muscorum* (Brisout) F., common in tidal refuse; W., occasionally in grass tufts; M.H., a few exx.
A. (*A.*) *fungi* (Gravenhorst), the commonest and most widespread Staphylinid in the area, occurs practically everywhere, even in very dry places. The male appears to be excessively rare at Spurn, only two having been seen out of more than 100 exx. examined. The spermatheca of the female is extremely variable, hardly any two specimens (more than 40 examined) being exactly alike. (L.B.D.; Kilnsea Saltings; Welwick.)
A. (*A.*) *orbata* (Erichson) M.H., D., at roots of vegetation, a few exx. only.
A. (*A.*) *clientula* (Erichson) very widespread, but much less common than *fungi*. Common in grass tufts, Spurn Point, Aug., 1949.
A. (*A.*) *laticollis* (Stephens) M.H., at roots of marram; F., in tidal refuse; M.M., in straw heap; common. Occasional specimens elsewhere. (Welwick, in salt marsh, 20/6/47.)
Halobrecta algae (Hardy) (=*puncticeps* (Thomson)) F., common and widespread under seaweed and tidal debris. (Welwick, in salt marsh, 20/6/47.)
H. flavipes Thomson, F., distributed as *algae*, with which it occurs. (Welwick, in salt marsh, 20/6/47.)
Drusilla canaliculata (Fabricius), almost as widespread as *Atheta fungi*, adults and larvae very common. Occurs with or away from ants (*Myrmica* sp.).
Tinotus morion (Gravenhorst) M.M., PH., common in dung.
Calodera aethiops (Gravenhorst) PH., not uncommon in reed debris. (L.B.D., in reed debris, 16/8/49).
Chiloporata longitarsis (Erichson), a few exx. in D. and on sea cliffs near PH, June, 1950. Common in damp places on sea cliffs and on the very low ' cliffs ' on the Humber shore, 6/51. No specimens seen in 1952 or prior to 1950.
Meotica exilis (Erichson) PH., in reed debris, 20/8/49, 1 ex.
Oxypoda (*Disochara*) *longiuscula* Erichson PH., in reed debris, 14/8/49, 1 ex.
O. (*Podoxya*) *brevicornis* (Stephens) (=*umbrata* (Gyllenhal)) PH., in reed debris, 23/7/48; wet place on sea cliff, 12/7/52. (Welwick, in salt marsh, 20/6/47.)
O. (*Baeoglena*) *exoleta* Erichson, a few exx. dug up from damp sand under moss near S.M. area, June 1950. W., common at roots of vegetation in a sheltered place, June 1951, much less common, July 1952.
O. (*Bessopora*) *haemorrhoa* (Mannerheim) M.M., common in straw heap.
O. (*B.*) *amoena* Fairmaire and Laboulbene M.M., in straw heap, 9/6/50, 1 ex. (Kilnsea Saltings, on mud, 7/6/50, 1 ex.)

Microglotta nidicola (Fairmaire), common in and around sand martins' nests in sea cliffs near PH. PH., occasional exx. on wing.

M. gentilis (Markel) PH., in stable refuse, 8/6/50, 1 ex., this would appear to have been carried, in the refuse, from a stable in which there was an owl's nest.

Aleochara (*s. str.*) *bipustulata* (Linnaeus), very common and widespread, occurs particularly in tidal refuse (F.) and carrion (F., S.), also taken in reed debris (PH.) The specimens are very variable in size.

A. (*s. str.*) *bilineata* Gyllenhal, F., a few exx. in carrion, June 1947.

A. (*Copiata*) *curtula* (Goeze) F., S., common at times in carrion.

A. (*Baryodma*) *intricata* Mannerheim M.M., PH., abundant in dung.

A. (*Homoeochara*) *sparsa* Heer, wet place on sea cliff, 12/7/52, 1 ex. (Kilnsea Saltings, on mud, 7/6/50, 1 ex.)

A. (*Polychara*) *lanuginosa* Gravenhorst M.M., PH., common in dung; occasional specimens elsewhere.

A. (*Rheochara*) *cuniculorum* Kraatz, W., not uncommon in rabbit burrows and fox earths.

A. (*Emplenota*) *grisea* Kraatz
A. (*E.*) *obscurella* Gravenhorst
A. (*E.*) *algarum* Fauvel
} F., common and generally distributed in and under seaweed, etc.; also in carrion on F. and S.

X. HYMENOPTERA excluding Aculeata

W. D. HINCKS

In dealing with the orders of insects which have been reported on so far it has been possible to include virtually complete accounts of the material collected. Unfortunately such treatment is impossible in the Hymenoptera, the subject of the present report. Only in the Symphyta (sawflies) and Aculeata (ants, bees and wasps) can a reasonably complete picture of the Spurn fauna be presented. The rest of the order, representing a quarter of the entire British insect fauna, consists of the parasitic groups, and it is regrettable but necessary to state that owing to a century and a half of neglect in favour of the Lepidoptera and Coleoptera, the taxonomy of these biologically important insects is in such a primitive condition that only a few of the more striking species can be identified. Even the few hard-pressed specialists at present cannot provide names for more than a proportion of the species in their respective groups; indeed there are whole families (such as the Ceraphrontidae) which must be regarded as quite hopeless at present. The past and present neglect of parasitic Hymenoptera by entomologists and the inherent taxonomic difficulties which some of the families present render our revisional progress very slow and it will be many years before the literature for the identification of the Parasitica reaches the level now achieved in the Coleoptera.

Only a small proportion of the specimens collected, owing to the great amount of work involved, have been examined by the specialists whose names appear later in this report. Without their kind help, however, there would be virtually no report on the Parasitica. Another reason for the scantiness of the report which, incidently, includes rather less than half of the species of Hymenoptera collected at Spurn, is the fact that a rather large number of our captures belong to species which appear to be new to science. Some of these are known to me under the manuscript names given them by the specialists but obviously such names cannot be used until the respective revisions have been published. Under the circumstances the best that can be done is to present a partial report with a promise to supplement it when possible. It may be said that the Hymenoptera of Spurn are at least as numerous in species as the Coleoptera so that much needs to be added in the future to the present report.

Spurn is an excellent area for Hymenoptera and some brief notes on our collecting may be of interest. Sandy areas are always favoured ones for Aculeates, especially when they are coastal. Spurn is no exception and a rich fauna of bees and wasps occurs there. The Aculeata will be reported on by Mr. Shaw so that I shall merely mention them very briefly. The Warren with its extensive flora is the best ground for Aculeates but many species occupy suitable sites all along the peninsula. Compacted sandy banks and the low, boulder clay cliffs on both sides of the peninsula are favoured by colonies of the burrowing species; the filigree-work entrance tunnels of *Ancistrocerus* spp. may be seen projecting from the clay banks behind the cottage.

On the Warren old mouse-nests are utilised by bumble bees and the very handsome black variety of *Bombus ruderatus* and the fine cuckoo bee *Psithyrus rupestris* are often plentiful in the cottage garden. The brilliantly coloured rubytails or cuckoo wasps (*Chrysis* spp.) are plentiful in hot sun on the walls of the cottage and on posts along the road. Solitary bees and wasps are often plentiful on the flowers of the ragwort and on other composites. There can be very few localities in Britain and certainly none elsewhere in Yorkshire where, in such a small area, as many as ten species of Dryinidae and Bethylidae can be found. The former are extraordinary parasites of froghoppers and allied insects (although now included in the Aculeata). Only females have yet been discovered at Spurn and in this sex the insects have large and very curious chelae on the front tarsi which enable them to attach themselves firmly to their hosts whilst egglaying. The Dryinids bear a close superficial resemblance to black ants and are found at Spurn in the Marram areas where several species of ants abound. In the same spots a number of parasitic Hymenoptera occur which also resemble ants. The resemblance is very striking to the collector working amongst the marram stems but it may be, and indeed probably is quite fortuitous. Most of these ant-like insects are either wingless or brachypterous and the resemblance to ants is perhaps merely a matter of brachyptery for if we remove the wings from almost any small hymenopteran it will resemble an ant. It is perhaps a coadaptation to the exposed, windswept habitat rather than an association of species of any deeper significance. The following is a short list of the antlike Hymenoptera which we have found in the Marram areas at Spurn (as far as it has been possible to provide names for them).

Formicidae: *Myrmica* spp., *Lasius niger* (L.), *L. flavus* (F.), *Formica fusca* L. Braconidae: *Chasmodon apterus* (Nees), *Atopandrium loripenne* Graham. Ichneumonidae: *Gelis* spp., *Pezolochus rufipes* Fst., *Hemiteles inaequalis* (Fst.); *H. gravenhorstii* (Ratz.), *Phygadeuon heinemanni* (Fst.). Cleonymidae: *Macroneura vesicularis* (Retz.). Encyrtidae: *Ectroma rufum* (Dalman). Pteromalidae: *Theocolax formiciformis* Westw. Proctotrupidae: *Paracodrus apterogynus* (Hal.). Also several other Proctotrupoids. Dryinidae: *Gonatopus sepsoides* Westw., *Pseudogonatopus distinctus* (Kff.), *Dicondylus bicolor* (Hal.), *Neogonatopus lunatus* (Klug.).

Perhaps more than any other order Hymenoptera are ' children of the sun ' and are affected by adverse climatic conditions. In July 1948 these conditions were just right and coincided with the blooming of the celery and carrot. As a consequence that visit produced an almost bewildering collection of Hymenoptera from these flowers which were often literally covered with insects in the warm sun. July 1952 was good but did not compare with 1948 and many species have been taken by us only on that occasion. This illustrates how difficult it is to form an accurate idea of the insect population of even a small area except by visiting it regularly throughout the season for a considerable number of years. The conditions of July 1948 may not occur again for a very long period. Not only do the climatic conditions affect Hymenoptera but there is also a marked seasonal succession of species. Unfortunately it is not possible to discuss this fully as far as Spurn is concerned since our visits have been confined to June and July only except for one visit in August. The Pompilidae (spider wasps) at Spurn seem to show a well-marked succession and the most abundant species of early June (*P. plumbeus*) is later much reduced in numbers and replaced by several other species. These spider wasps form an important part of the Spurn Aculeate fauna and it is interesting to find them forming part of a food-chain which can be traced from the Marram grass. At the roots of the grass the larvae of the beetle *Euchlora aenea* feed and they are attacked by the ectoparasitic larvae of flies of the genus *Thereva* (of which *T. annulata* F. and *T. nobilitata* F. are the common species). The adult flies frequently fall as prey for the common ground spiders such as *Pirata piraticus* Clerck, and in turn the spiders form the prey of the Pompilids.

Aculeates were collected individually with a net and many Ichneumons were picked off flowers with the fingers, especially off celery and carrot blossom. Small brachypterous Hymenoptera were hand-picked or sucked up by means of an aspirator whilst grubbing at the roots of the marram. In addition a very large number of small parasitic species were collected by sweeping herbage on the Warren, in the Dyke and Marsh Meadow and elsewhere. This method of collecting has serious ecological disadvantages but is the only way, during a short visit, by which the presence of many small species is revealed. For example, the minute Mymaridae

(Fairyflies) which are parasitic on insect eggs would not figure in our lists except for this type of collecting.

Among the groups of Hymenoptera, which are poorly represented at Spurn, may be mentioned the aphid parasites (Aphidiinae). This deficiency is correlated with the paucity of aphids during our visits. It was not until 1952 that we met with an ' aphid year ' and although greenfly were then fairly abundant the parasites had not caught up and were still rather poorly represented. Gall wasps (Cynipidae), except for some of the parasitic species are naturally poorly represented as many of their host-plants are trees which are practically absent from the peninsula.

I think it is clear from our collecting experiences at Spurn that July is by far the best month for Hymenoptera, except sawflies, and the best areas for collecting are very much the same as those which were profitable for Coleoptera.

I should like to thank members of the Spurn parties for many interesting specimens and Mr. S. Shaw for his constant help in the field and in the museum. I very much appreciate the kind help given me by the specialists whose initials occur so frequently in the following lists: R. B. Benson (R.B.B.), H. Britten (H.B.), R. D. Eady (R.D.E.), M. V. R. de V. Graham (M.G.), G. J. Kerrich (G.J.K.), G. E. J. Nixon (G.N.), J. F. Perkins (J.F.P.), A. W. Stelfox (A.W.S.).

The following signs are used before certain specific names: ‡ new to Britain, † new to Yorkshire, * new to Vice-county 61.

It is of interest to note that twelve species in the following report appear to be additions to the British fauna.

SYMPHYTA (Sawflies)

The sawfly fauna of Spurn is relatively small, only 36 species having been taken, but it should be noted that our visits have been too late in the year for the peak flight period of the spring broods and only a single visit has been made in August when the summer broods are on the wing. In June individuals of several species are very numerous but during the period between the broods, namely in July, very few sawflies are to be found. Most species were taken on the Warren but several *Doleri* were only to be found associated with small areas of *Equisetum* and *Juncus*. Several species of *Athalia* and the dominant *Tenthredopsis nassata* appear to be distributed, in season, throughout the peninsula.

I am very much indebted to Mr. R. B. Benson for help with some of the identifications.

Calameuta pallipes (Klug) Food-plant unknown. M.M., 20/6/51, 1♂; W., 24/6/51, 1♂.

Arge cyaneocrocea (Forster) Common on Umbelliferae; larval food-plant *Rubus*. Railway lines near S.M., 16/6/47; D., 19/6/47; W., 6/50, 6/51!

**Tenthredo acerrima* Benson (*sulphuripes* Benson, *nec* Kriechbaumer) Larva unknown. Railway lines near S.M., 16/6/47, on umbells.; W., 19/6/47, 23/7/48, 19/6/51, 12, 14/7/52!

T. atra v. *dispar* Klug Larva polyphagous. Railway lines near S.M., 16/6/47, 1♂.

Aglaostigma aucupariae (Klug) Larva on *Galium*. W., 6/50, 6/51!

Tenthredopsis nassata (Linnaeus) Larva on Gramineae. W., 6!!, 7!, 8; S.M., 15/6/47; D., 19/6/97; M.H., 15/6/47. [L.B.D., 6/6/50.]

Pachyprotasis rapae (Linnaeus) Larva polyphagous. W., 10/6/50; S.M., 16/6/51.

Loderus vestigialis (Klug) Larva on *Equisetum*. W., 11/6/50, 1♂, S.S.

Dolerus aeneus Hartig Larva on Gramineae. D., 19/6/47; M.M., 6/6/50; W., 6/50, 6/51. [L.B.D., 18/6/51.]

**D. triplicatus* (Klug) Larva on *Juncus*. A local species hitherto taken only from single stations in V.C. 63 and 64. W., 4/6/50; PH., 4/6/50. [Saltings, 7/6/50.]

D. madidus (Klug) Larva on *Juncus*. A local species. W., 23/7/48, 1♀. [Lane near Saltings, 17-18/7/52, 2♀♀.]

D. aericeps Thomson Larva on *Equisetum*. W., 23/7/48!!, 12, 15/7/52. [Lane near Saltings, 17-18/7/52!]

D. gonager (Fabricius) Larva on Gramineae. W., 19/6/51, 1♀.

D. picipes (Klug) Larva on Gramineae. W., 6/50, 6/51; M.M., 3/6/50.

D. nigratus (Mueller) Larva on Gramineae. W., 6/50, 6/51; PH, 4/6/50; M.M., 6/6/50. [L.B.D., 6/6/50, 18/6/51.]

†*D. taeniatus* Zaddach Food-plant unknown. An interesting species previously known only from single salt-marsh habitats in Devon, Essex and Suffolk. W., 10/6/50. [Saltings, 20/6/50.] About a dozen specimens of both sexes were taken and the determination has been confirmed by Mr. Benson.

**Monostegia abdominalis* (Fabricius) Larva on *Lysimachia vulgaris* L., *L. nummularia* L., and *Anagallis arvensis* L. Railway lines near S.M., 16/6/47. [L.B.D.]

[*Ametastegia glabrata* (Fallen) Larva on Chenopodiaceae and Polygonaceae. L.B.D., 16/8/49, 1♀.]

**Athalia rosae* (Linnaeus) Larva on turnips and other crucifers, sometimes a serious pest. Apparently extinct in Britain for a century until about 1945. First noticed at Spurn in 1947 it has increased in numbers each year until 1952 when it was not observed. On umbells, etc. Near S.M., 18/6/47; PH., 15/8/49; W., 14/8/49; 6/50, 6/51!! [L.B.D., 18/6/51.]

A. glabricollis Thomson Larva on Cruciferae. W., 20/7/48, 12/8/49 (on *Senecio* flowers); D., 14/8/49.

A. bicolor (Lepeletier) Larva probably on *Ranunculus*. Railway lines near S.M. on umbells, 16/6/47, 1♂.

A. cordata (Lepeletier) Larva on *Ajuga reptans* L., *Plantago*, etc. Near S.M., 18/6/47; M.R., 13/8/49 (on *Senecio*); P.H. 13/8/49; W., 15, 16/8/49; D., 4/8/49.

A. lineolata (Lepeletier) Larva polyphagous. M.M., 14/8/49!; W., 23/7/48, 15/8/49; PH., 13/8/49; S.M., 16/6/51.

[*Selandria serva* (Fabricius) Larva on Cyperaceae, Gramineae and Juncaceae. L.B.D., 18/6/51, 1♀.]

[*Endelomyia aethiops* (Fabricius) Larva on *Rosa*. Lane near Saltings, 17-18/7/52, 1♀.]

Cladius pectinicornis (Geoffroy) Larva on *Rosa*. W., 20/7/52, 1♂.

Priophorus tener (Zaddach) Larva on *Rubus*. W., 20/7/48, 1♀.

Holcocneme coeruleocarpa (Hartig) Larva on *Salix* and *Populus*. W., 19/6/51, 1♀.

Pteronidea mysotidis (Fabricius) Larva on *Onobrychis* and *Trifolium*. PH., 21/6/51, 1♂.

**Pachynematus diaphanus* (von Eversmann) Larva on *Salix*? D., 19/6/47; W., 16, 20/6/51; M.H., 23/6/51. [Saltings, 10/6/50, 20/6/51.]

P. clitellatus (Lepeletier) Larva on *Carex*. W., 18, 19/6/51.

†[*P. truncatus* Benson, 1948, *Ent. mon. Mag.*, **84**, 63. Larva unknown. L.B.D., 6/6/50.]

**P. obductus* Hartig Larva on Gramineae. Sea cliffs, 14/7/52; W., 19/7/52.

Pachynematus sp. W., 13/6/47, 1♀.

Pristiphora denudata Konow Larva unknown. W., 25/6/51, 1♀.

[*P. ruficornis* auct. (*nec* Gmelin) Larva on *Crataegus*. Lane near Saltings, 17-18/7/52, 1♂. Mr. Benson tells me that the valid name of this species has not yet been decided.]

BRACONIDAE

Braconids are parasites of the larvae (rarely adults) of insects belonging to many different orders. Some sub-families, such as the Braconinae and Helconinae, attack insects of several orders whilst other sub-families are more or less restricted to a single order. The Microgastrinae and Agathidinae are largely parasites of Lepidoptera, the Alysiinae principally of Diptera, and the Aphidiinae attack aphids.

Unfortunately only a small proportion of our material of this family can be determined at present and consequently the richness of the Spurn fauna is not very evident from the following list. This point may be illustrated by reference to the genus *Bracon* of which about 25 species have been taken at Spurn, a surprisingly large number for such a restricted area. Up to the present however only 9 species have been definitely identified with previously described species. A further half dozen are known to me by manuscript names but are still undescribed. The rest do not appear to agree with the described British and Continental species although some certainly will prove to be merely variants of previously described species, a point which cannot be settled except by comparison with the type specimens. It is clear, however, that a number of undescribed species of *Bracon* are represented in our Spurn collections.

BRACONINAE

‡*Bracon spurnensis* Hincks, 1951, *Ent. mon. Mag.*, **87**, 232, fig. D., 22/7/48, holotype ♀; 18/7/48, paratype ♂. [L.B.D., 21/6/47, paratype ♂; lane near Saltings, 17-18/7/52, 1♀.]

B. anthracinus Nees W., M.H., M.M., PH. [Saltings], 6, 7!! The commonest species of the genus at Spurn.
B. terebella Wesmael W., 20/7/48, 13/7/52; M.M., 17/6/51. [Lane near Saltings, 17-18/7/52!]
*[*B. osculator* Nees L.B.D., 18/6/51.]
**B. discoideus* Wesmael PH., 13/8/49.
**B. variator* Nees W., 21/6/51, 14, 19/7/52; PH., 15/8/49. [Lane near Saltings, 17-18/7/52.]
B. fulvipes Nees W., 7/52!
*[*B. exhilator* Nees L.B.D., 18/6/51.]
†*B. larvicida* Marshall M.H., 16/6/47.
†*Rogas geniculatus* Nees Near S.M., 18/6/47, 1♀ (det. A.W.S.); W., a ♂ emerged on 20/6/47 from a small dry larva of the Drinker moth (*Philudoria potatoria* L.) (cf. the account in Marshall, 1885, *Trans. ent. Soc. Lond.*, **1885**, 94); W., 12, 19/7/52, 2♀.
Rogas sp. nov.? F., under stone, 14/6/47; M.S., 15/6/47; M.H., 15/6/47; W., 18/8/49, 23/6/51. Although this species is unnamed it is mentioned because it may prove to be a characteristic sand-dune species. Mr. Stelfox has taken it in similar situations in Kerry.
R. circumscriptus Nees, complex. W., 12/7/52, 1♀ emerged 16/7 from parasitised sawfly larva.

SIGALPHINAE

More than a dozen species of this sub-family were captured, some in considerable numbers, but except for the undermentioned their identifications must await Mr. Graham's projected revision.
†*Ascogaster quadridentatus* Wesmael S.M., 19/7/48 (det. A.W.S.).
**Triaspis caudata* (Nees) W., 14/7/52. [Saltings, 16/7/52; lane near Saltings, 17/7/52.]
**T. floricola* (Wesmael) W., 14/7/52! M.M., 16/7/52! [Saltings, 15, 16/7/52!]

MICROGASTRINAE

†*Apanteles viminetorum* Wesmael M.H., 13/6/47, 1♀ (det. G.N.).
**A. falcatus* (Nees) W., 14, 15, 19/7/52. [Lane near Saltings, 17-18/7/52.]
†*A. infirmus* (Haliday) D., 28/7/48, 12/7/52; M.M., 16/7/52. [Lane near Saltings, 17/7/52.]
*[*Microgaster meridiana* Haliday Lane near Saltings, 17-18/7/52, 2♀♀.]
†*Microplitis tuberculifer* (Wesmael) PH., 17/8/49, 1♂.

AGATHIDINAE

†*Agathis tumidula* (Nees) W., 20/7/48 (det. A.W.S.), 15/7/52. [L.B.D., 22/7/48.]
**A. clausthaliana* (Ratzeburg) W., 12/7/52, 20/7/52. [Lane near Saltings, 17-18/7/52.]

HELCONINAE

†*Blacus ruficornis* (Nees) W., 20/7/52, 1♀. [L.B.D., 16/8/49, 1♀, det. A.W.S.]
**B. paganus* Haliday D., 12/7/52, 1♀.
†*Orgilus obscurator* (Nees) S.M., 16/6/47, 1♂.
**Macrocentrus marginator* (Nees) W., 15/7/52, 1♂.
M. linearis (Nees) W., 19/7/52, 1♀.
**M. infirmus* (Nees) M.M. on surface of Crater pond, 17/6/51, 1♀.
**Diospilus capito* (Nees) W., 12/8/49, on *Senecio* flrs. (det. A.W.S.), 14/7/52; sea cliffs, 13/7/52. [Saltings, 16/7/52.]
**D. morosus* Reinhard D., 14/8/49; PH., 17/8/49; W., 12, 15/7/52.
D. oleraceus Haliday? PH., 15/8/49, a small ♂ (det. A.W.S.).
†*Meteorus rubens* (Nees) W., 12/8/49, at light (det. A.W.S.), 14, 17/8/49, 19/8/49, 19/6/47, 12/7/52; S.M., 18/6/51.
†*Perilitus rutilus* (Nees) W., 7/6/50; PH., 21/6/51. [Lane near Saltings, 21/6/51.]
*[*Microtonus aethiops* (Nees) Lane near Saltings, 16/7/52.]
**Euphorus pallipes* (Curtis) M.M., 17/6/47; M.H., 15/6/47; M.R., 3/6/50; W., 15/8/49, 23/6/51; D., 17/8/49. [Lane near Saltings, 17/7/52.]
†*Opius decoratus* Stelfox (1949, *Ent. mon. Mag.*, **85**, 307). PH., 21/7/48, 1♀ (det. A.W.S.). [L.B.D., 18/6/51, 1♀.]
Five other species of *Opius* also occur at Spurn.

ALYSIINAE

‡[*Atopandrium loripenne* Graham, 1952, *Ent. mon. Mag.*, **88**, 20, fig. L.B.D., 16/8/49, 1♂, holotype.]
Chasmodon apterus (Nees) W., 20/7/48, 23/6/51, 12/7/52; D., 17/8/49; PH., 20/8/49; sea cliffs, 21/6/51, 14/7/52; Spurn Point, 19/8/49.
**Aphaereta minuta* v. *cephalotes* (Haliday) Sea cliffs, 14/7/52, 1♀.
**Idiasta maritima* (Haliday) D., 21/7/48. [Lane near Saltings, 17/7/52.]
Alysia manducator (Panzer) W., 20/7/52, 1♀.
**Phaenocarpa conspurcator* (Haliday) M.M., 3/6/50; W., 15/7/52. [Lane near Saltings, 17-18/7/52.]
†*P. pullata* (Haliday) M.M., on surface of crater pond, 17/6/51, 1♀.
**P. ruficeps* (Nees) W., 18/7/48, 15/7/52! [Lane near Saltings, 17-18/7/52!!]
†*P. livida* (Haliday) PH., 21/7/48, 1♀ (det. A.W.S.).
‡*Aspilota dilatata* Thomson D., 22/7/48, 1♀ (det. A.W.S.).
†[*Dacnusa abdita* Haliday Kilnsea village, 18/6/47, 1♀, det. G.N.]
†*D. elegantula* Nixon M.M., 17/7/47, 1♀ (det. G.N.).
Rhizarcha areolaris (Nees) S.M., 18/6/47! (det. G.N.); W., 19/6/47; dense scrub near S.M., 16/6/47; M.H., 13/6/47.
**R. pubescens* (Curtis) S.M., 18/6/47 (det. G.N.).
‡*Coelinidea parvipennis* (Thomson) W., 17/7/48, 1♀ (det. A.W.S.); D., 19/6/47, 1♀.

APHIDIINAE

†*Trioxys brevicornis* (Haliday) W., 14, 15/7/52, 2♀♀ (det. A.W.S.).
**T. heraclei* (Haliday) W., 12, 14, 15/7/52, 4♀♀ (det. A.W.S.).
**T. cirsii* (Curtis) W., 12/7/52, 1♀ (det. A.W.S.).
**T. centaureae* (Haliday) W., 16/7/52, 1♀.
Two new species of *Trioxys* were taken on the Warren, 16/7/52, and in the lane near the Saltings on 17/7/52.
†*Praon abjectum* (Haliday) PH., 19/8/49, 1♀ (det. A.W.S.).
**P. volucre* (Haliday) PH., 9/6/50, 1♂. [Lane near Saltings, 17-18/7/52, 2♂♂.]
Aphidius avenae Haliday S.M., 16/6/47; D., 12/7/52; W., 7/52!!; PH., 19/7/52. [Lane near Saltings, 7/52!!]
†*A. sonchi* Marshall W., 14, 15/7/52, 2♀♀. [Lane near Saltings, 17-18/7/52, 1♀.]
*[*A. granarius* Marshall Lane near Saltings, 16/7/52, 1♀.]
†*A. pterocommae* Marshall W., 20/7/52, 1♀, reared from aphid on *Ononis*, 25/7/52.
†*A. dissolutus* (Nees) Sea cliffs, 14/7/52, 1♀ (det. A.W.S.).
†*A. crepidis* Haliday W., 14/7/52, 1♀ (det. A.W.S.).

ICHNEUMONIDAE (Ichneumon flies)

During our visits to Spurn Ichneumons have been relatively numerous in species and individuals especially in July and August when they occur on flowers particularly on the Warren. Many of the most striking species were collected only during July 1948 and have not been taken since or only very sparingly. As already mentioned this is believed to be the result of favourable climatic conditions.

As with other families of the Parasitica it has not been possible at this stage to prepare a full report owing to the taxonomic difficulties and the time involved, but the following list would have been much smaller were it not for the kind help of Mr. J. F. Perkins of the British Museum and Mr. Harry Britten.

Ichneumonids were collected by netting or hand-picking from the flowers of wild carrot and celery, etc., by general sweeping, and by grubbing in the case of the terrestrial brachypterous or apterous species (*Gelis*, etc.). These insects are parasites of the larvae of Lepidoptera, Diptera, Symphyta, etc.

ICHNEUMONINAE

**Protichneumon fuscipennis* (Wesmael) This fine, large, and very powerful ichneumon fly was only taken during our July 1948 visit when it was fairly common on the Warren on the flowers of celery. Its host at Spurn is probably the Eyed Hawk moth (*Smerinthus ocellatus* L.) larvae of which were seen in August 1949 (see *Nat.*, 1951, 186).
Coelichneumon impressor (Zetterstedt) W., 23/7/48, 2♂♂ (det. J.F.P.).
Melanichneumon nudicoxa Thomson W., 25/7/48, 14/7/52; M.R., 13/8/49.
M. saturatorius (Linnaeus) W., 14/8/49, 1♀.

Barichneumon deceptor (Gravenhorst) W., 17, 23/7/48, 12/7/52 (det. J.F.P.).
†*B. heracleanae* (Bridgman) W., 19/8/49, 1♀ (det. J.F.P.).
Ichneumon extensorius Linnaeus W., 7/48!!, 14/8/49, 19/6/51, 12/7/52.
I. latrator Fabricius W., 20/7/48, 1♂.
I. sarcitorius Linnaeus W., 7/48!!, 19/6/51. [L.B.D., 6/6/50.]
†*Exephanes hilaris* (Gravenhorst) W., 7/48!, 14/7/52 (det. J.F.P.).
†*Ctenichneumon inspector* (Wesmael)? W., 23/7/48, 1♂ (det. J.F.P.).
C. castigator (Fabricius) W., 23/7/48, 1♀.
†*Spilichneumon occisorius* (Fabricius) Railway lines near S.M., 16/6/47, 1♀.
Amblyteles fossorius (Linnaeus) W., 7/48!, 15/8/49; S.M., 18/6/47; D., 18/7/48.
[*Alomya debellator* (Fabricius) Saltings, 20/6/51.]

CRYPTINAE

Aptesis abdominator (Gravenhorst) Near S.M., 18/6/47; M.R., 23/6/51!; W., 16, 19/6/51; PH., 21/6/51.
Glyphicnemis profligator (Fabricius) W., 7/48 [Lane to Saltings, 17-18/7/52!]
†*Phygadeuon sodalis* Taschenberg F., 18/8/49, 1♀ (det. J.F.P.).
P. vexator (Thunberg) W., 7/48!!; D., 21/7/48; S.M., 19/7/48 (det. J.F.P.).
†*P. heinemanni* (Foerster) Sea cliffs, 14/7/52, 1♀.
†*Hemiteles inaequalis* (Foerster) M.H., 13, 16/6/47, 23/6/51; W., 23/6/51.
†*H. gravenhorstii* (Ratzeburg) W., 18/8/49 (det. J.F.P.); M.H., 23/6/51. [Lane to Saltings, 17/7/52.]
**H. bipunctator* (Thunberg) W., in cottage, 23/6/51, 1♀.
**H. atricapillus* (Gravenhorst) W., 12/7/52, 1♀.
**Gelis instabilis* (Foerster) M.H., 13, 15/6/47; W., 19/6/47, 12, 14/7/52; PH., 20/8/49. [Lane to Saltings, 17, 18/7/52!; Saltings, 7/6/50.]
†*G. gonatopina* (Thomson) M.H., 13, 15/6/47; W., 19/6/47; Humber cliffs, 21/6/51.
**G. zonata* (Foerster) Sea cliffs, 13/7/52, 1♀, a large specimen 5 mm. long, twice the bulk of the PH. specimen; PH., 8/6/50, 1♀, small specimen 3.2 mm. A parasite in spider's nests.
**G. ochracea* (Foerster) M.H., 8/6/50, 1♀, 16/6/47, 1♀; railway lines near S.M., 16/6/47, 1♀; W., 8/6/50, 1♀?
**G. melanocephala* (Schrank) D., 17/8/49, var.? [Welwick, 18/8/49, 1♀; Skefling, 15/8/49, var.?]
†*G. comes* (Foerster)? PH., 4/6/50, 1♀.
†*G. distincta* (Foerster) M.H., 13, 16/6/47; 23/6/51; W., 16, 19/8/49, 23/6/51; F., 22/6/51; S.M., 8/6/50; sea cliffs, 8/6/50.
**G. modesta* (Foerster) W., 15/7/52.
Several other species of *Gelis*, at present unidentified, also occur at Spurn.
†*Pezolochus rufipes* Foerster D., 19/6/47, 1♀; W., 3/6/50, 1♀, 19/7/52, 1♀.
‡*Listrocryptus spatulatus* Brauns W., 25/7/48, 1♀ (det. J.F.P.).
‡*Cryptus arenicola* Thomson W., 18/7/48, 1♀ (det. J.F.P.).
C. tarsoleucus (Schrank) W., 7/48!, 10/6/50!, 19/6/51, 17/7/52. [L.B.D., 22/7/48.]
C. viduatorius Fabricius W., 17, 20/8/48, 2♀♀ (det. J.F.P.).
†*C. titubator* (Thunberg) W., 11/6/50, 1♂.
†*Trychosis legator* (Thunberg) W., 7/48! Railway lines near S.M., 16/6/47; M.H., 15/6/47 (det. J.F.P.).
Ischnus porrectorius (Fabricius) W., 13/8/49, 1♀.
**Pycnocryptus director* (Thunberg) W., 23/7/48, 1♀.
†[*Agrothereutes ornatulus* (Thomson) L.B.D., 22/7/48, 1♀ (det. J.F.P.).]
**A. migrator* (Fabricius) F., 19/7/48, 1♀; S.M., 18/6/47, 1♀.

PIMPLINAE

Pimpla instigator (Fabricius) W., 4, 9/6/50, 19/6/51.
**P. flavicoxis* Thomson W., 25/7/48, 1♀; S.M., 16/6/51, 1♀.
Itoplectis maculator (Fabricius) W., 25/7/48, 10/6/50, 21/6/51, 12/7/52; D., 15/7/48.
Perithous divinator (Rossi) S.M., 16/6/51, 1♂.
†*Ephialtes mesocentrus* Gravenhorst W., 10/6/50, 1♀. A single female of this fine, large species was taken hawking round a bush in the cottage garden. It was probably a casual as Spurn is an unsuitable locality for this species.
E. stercorator (Fabricius) S.M., 18/6/47; W., 20/7/48, 25/6/51; M.R., 23/6/51.
E. calobatus (Gravenhorst) W., 10/6/50, 12, 13/7/52.

E. detritus (Holmgren) W., 16/6/51, 12, 14, 19/7/52; PH., 24/6/51. [Lane to Saltings, 17-18/7/52.]
**E. inquisitor* (Scopoli) Near S.M., 16/6/47; W., 23/7/48, 15, 16, 19/8/49.
E. nigricans (Thomson) M.M., 17, 19/6/46; W., 19, 23/6/51, 14/7/52.
†*E. dilutus* (Ratzeburg) PH., 15/8/49, 1♀; W., 19/8/49, 1♀ (det. J.F.P.).
†*Glypta teres* Gravenhorst W., 14/7/52, 2♂♂.
**G. sculpturata* Gravenhorst W., 16/7/52, 1♀.
G. mensurator (Fabricius) W., 17, 18, 23/7/48, 14/7/52. [Lane to Saltings, 11/7/52; Saltings, 15/7/52.]
**G. trochanterata* Bridgman W., 23/6/51, 1♀.
**Conoblasta fronticornis* (Gravenhorst) M.S., 13/7/52, 1♂.
†*C. monoceros* (Gravenhorst) D., 19/6/47!, 12/7/52; W., 15/7/52.
†*Diblastomorpha bicornis* (Boie) W., 18/7/48, 14/7/52. [Lane to Saltings, 17-18/7/52.]
Lampronota piceator (Thunberg) W., 19/6/51, 1♀.
Lissonota cylindrator (de Villers) W., 7/48!! on umbells., 7/52.
†*L. parallela* Gravenhorst W., 17/7/48, 2♀♀.
L. bellator (Gravenhorst) W., 7/48!, 19/7/52. [Lane to Saltings, 17-18/7/52.]
†*L. biguttata* Holmgren W., 13/7/52, 1♀.
†*Exetastes femorator* (Desvignes) W., 17, 20, 23/7/48, 2♂♂, 2♀♀ (det. J.F.P.). This is a rare species, the latest British record mentioned by Morley (1907, British Ichneumons, **3,** 301) is that of Smith who took it on the Deal sandhills in 1856. I do not know of any more recent record.
Banchus pictus Fabricius W., 7/48!, 12, 14/7/52.
B. falcatorius (Fabricius) W., 23/7/48, 1♂.
†*B. moniliatus* Gravenhorst W., 17, 23/7/48, 12, 14/7/52.
**Collyria calcitrator* (Gravenhorst) Near S.M., 18/6/47.

TRYPHONINAE

**[*Psilosage ephippium* Holmgren Lane near Saltings, 17-18/7/52.]
‡*Tryphon auricularis* Thomson W., 12/7/52, 1♂ (det. J.F.P.).
T. trochanteratus Holmgren W., 14/7/52.
T. vulgaris Holmgren W., 25/7/48 [Lane to Saltings, 17-18/7/52.]
T. rutilator L. M.M., 17/6/47. [Lane to Saltings, 17-18/7/52.]
†*Pion* (*Catoglyptus*) *crassipes* (Holmgren) W., 7/48! (det. J.F.P.); D., 19/6/47 18/7/48; M.H., 19/6/47; near S.M., 18/6/47; M.R., 23/6/51.
†*Rhorus longicornis* (Holmgren) W., 7/48!, 7/52! (det. J.F.P.).
**Hadrodactylus fugax* (Gravenhorst) W., 17/7/48, 1♀ (det. J.F.P.).
[*Exochus prosopius* Gravenhorst Lane to Saltings, 17-18/7/52.]
**[*Stenomacrus confinis* Holmgren L.B.D., 18/6/51, 1♀.]
†*S. binotatus* Holmgren S.M., 16/6/51. [Saltings, 20/6/51.]
**Zootrephus suspiciosus* (Brischke) W., 19/7/52, 1♂.
Diplazon annulatus (Gravenhorst) W., 19/8/49, 1♀, 23/6/51, 1♂.
**D. albosignatus* (Gravenhorst) W., 25/7/48.
D. tetragonus (Thunberg) W., 19/6/51, 1♂.
D. laetatorius (Fabricius) W., 13/6/47, 17, 25/7/48, 14/8/49, 23/6/51; D., 17/8/49.
†*D. flavolineatus* (Gravenhorst) W., 23/6/51, 1♀.
D. tarsatorius (Panzer) W., 13/7/48; M.M., 17/6/47.
**D. ornatus* (Gravenhorst) W., 25/7/48. [L.B.D., 16/8/49.]
**D. pulcher* (Holmgren) W., 19/7/52, 1♂; near S.M., 16/6/47, 1♀.
Promethes sulcator (Gravenhorst) W., 12/7/52, 1♂.

OPHIONINAE

Ophion stigmaticus Morley W., 14/7/52. [Kilnsea, 2/5/50] (det. H.B.).
**Agrypon flaveolatum* Gravenhorst W., 10/6/50, 1♀.
Campoplex nitidulator Holmgren W., 23/7/48, 4/6/50; S.M., 19/7/48.
‡*Eulimneria fuscicarpus* Thomson W., 7/48!!, 14, 16, 19/7/52; M.R., 14/7/52 (det. J.F.P.).
Meloboris crassicornis (Gravenhorst) D., 14/8/49, 12/7/52. [Lane to Saltings, 17/7/52.]
**Angitia rufipes* (Gravenhorst) W., 25/7/48, 15, 16/8/49, 9/6/50, 16/6/51, 12, 19/7/52; sea cliffs, 13/7/52. [Saltings, 15/7/52; Lane, 17-18/7/52.]
†*Parabates tarsatus* (Brischke) W., 14/8/49 (det. H.B.).

†*Paniscus brachycerus* Thomson W., 5, 9/6/50 (det. H.B.), at light 20/7/52, 19/6/51; M.R., 23/6/51.
**P. cephalotes* Holmgren W., 15/7/52, 1♀.
**P. testaceus* Gravenhorst W., 19/8/49, 10/6/50, 17/7/52 (det. H.B.).
Orthopelma mediator (Thunberg) W., 23/6/51, from a gall of *Rhodites rosae* (Linnaeus).

CYNIPIDAE (Gall wasps)

About 30 species of Cynipids have been collected but only 13 of them can be identified with certainty at present. Mr. Shaw kindly undertook the task of identification.

As would be expected from the absence of trees on the peninsula the gall-forming Cynipids are very restricted at Spurn. We are able to record only one rose gall-wasp and two attacking herbaceous plants. The Charipinae, which together with the Aphidiinae (Braconidae) and the Ceraphrontidae form parasitic complexes with aphid hosts, are represented by seven species, none of which can be definitely identified in the present state of our knowledge. The Figitinae and the Eucoilinae of which nine species can be named are parasites of Diptera.

CYNIPINAE

Rhodites rosae (Linnaeus) W., 22/6/51, gall on *Rosa* sp.
Aulacidea hypochaeridis (Kieffer) M.R., 18/7/52, galls common on *Hypochaeris radicata* L.
Xestophanes potentillae (Retzius) W., 15/7/52. [Lane to Saltings, 17/7/52.]

ANACHARITINAE

†*Aegilips dalmani* Reinhard W., 12/7/52; S.M., 16/6/51.

FIGITINAE

†*Figites consobrinus* Giraud PH., 15/8/49. [Lane to Saltings, 17/7/52.]
†*F. reinhardi* Kieffer W., 15/7/52, 20/7/52, near blowfly larvae on carcase. [Saltings, 20/6/51.]
†*Melanips femoralis* Cameron S.M., 16/6/51, 1♂.
†[*M. longitarsis* (Reinhard) Lane to Saltings, 17/7/52, 1♀.]

EUCOILINAE

†*Trybliographa diaphana* Hartig W., 12/7/52.
†[*Kleidotoma caledonica* Cameron Lane to Saltings, 17/7/52.]
†*K. truncata* Cameron D., 17/8/49.
†[*Microstilba striolata* Kieffer Lane to Saltings, 17/7/52.] This is the only British species of the genus, but the above specimen does not entirely agree with published descriptions.
†*Diglyphosema conjungens* Kieffer S.M., 18/6/47.

CHALCIDOIDEA

The Chalcids are a large group of minute to small parasites predominantly metallic green in colour. Aptly called ' the green myriads in the peopled grass ' by Francis Walker, these brilliant little insects are abundant at Spurn as elsewhere. They play a very important part in the control of other insects on account of their wide range of parasitic habits. Different species parasitise the egg, larval and pupal stages of insects and may be primary, secondary or even tertiary parasites.

More than a hundred species occur at Spurn and were collected chiefly by sweeping. As already mentioned some apterous or brachypterous species were also taken by searching the roots of marram. Unfortunately the taxonomic position in regard to Chalcids is critical indeed and it will be a long time before even a fraction of our British species can be identified with accuracy. As a consequence the present list includes barely a quarter of the species we have collected so far at Spurn.

CHALCIDIDAE

†*Brachymeria minuta* (Linnaeus) W., 23/6/51, 13/7/52. [Marram dunes near Saltings, 13, 15, 17/7/52.] This large species (for a Chalcid) is recorded as a

parasite of several species of Lepidoptera. After the first specimen was discovered by sweeping in 1951 we made special efforts to obtain further specimens and as a result of careful collecting 14 specimens in all were taken. Nearly all of them occurred in areas of almost pure marram.

EURYTOMIDAE

Eudecatoma mellea (Curtis) W., 15/8/49; PH., 15, 17/8/49; sea cliff, 13/7/52!

Harmolita hyalipenne (Walker) W., 16/7/52, 1♀. [Lane to Saltings, 17/7/52, 1♂.] Only two of our many specimens of *Harmolita* appear to belong to *H. hyalipenne* which is usually regarded as a common species causing swellings on the stems of couch grass (instead of being parasitic as the majority of Chalcids). These two specimens agree with a long series in the Manchester Museum collection.

Harmolita sp.? M.M., 17/6/47; W., 17/7/48, 12, 15/7/52!; sea cliff, 13/7/52. [Saltings, 15/7/52.]

Harmolita sp.? M.M., 17/6/47, 18/7/48, 3/6/50; M.H., 16/6/47; W., 7/6/50, 7/52!; D., 17/8/49, 18/6/51. [L.B.D., 18/6/51.]

TORYMIDAE

‡*Syntomaspis* sp. nov. Several specimens of this species, which Mr. Eady tells me is probably new, were taken on the Warren.

†*Torymus arundinis* (Walker) W., 19/7/52; PH., 15/8/49. [Lane to Saltings, 17/7/52] (det. R.D.E.).

†*T. macropterus* (Walker) S.M., 18/6/47, 1♀ (det. R.D.E.).

†*Cryptopristus caliginosus* (Walker)? dark var. W., 19/7/52, 1♀ (det. R.D.E.).

CLEONYMIDAE

**Macroneura vesicularis* (Retzius) M.H., 16/6/47, 23/7/48, 16/8/49; M.S., 13/8/49; P.H., 18/7/48, 17/8/49; S.M., 19/7/52; sea cliff, 13/7/52. [Lane to Saltings, 17/7/52.] A common species found running in marram grass.

ENCYRTIDAE

†*Ectroma rufum* (Dalman) M.H., 16/6/47, 11/6/50.

†*Cheiloneurus elegans* (Dalman) W., 20/7/48. [Lane to Saltings, 17/7/52.] (det G.S.K.).

†[*Choreia inepta* (Dalman) L.B.D., 6/6/50; Saltings, 7/6/50.]

PTEROMALIDAE

†*Habrocytus bedeguaris* Thomson W., from galls of *Rhodites rosae* on *Rosa* sp., emerged 23/6/51.

†[*H. trypetae* Thomson Saltings, 15/7/62; Lane, 17/7/52.]

**Callitula pyrrhogastra* (Walker) PH., 20/8/49 (det. G.J.K.); D., 21/7/48; W., 16, 19/8/49, 15, 19/7/52.

†*Homoporus gibbiscuta* Thomson W., 17/7/48, 1♀ (det. G.B.K.).

**Asaphes vulgaris* Walker PH., 13, 15/8/49; D., 17/8/49; M.R., on *Senecio* flowers, 13/8/49. A common aphid parasite.

†*Theocolax formiciformis* Westwood D., 17/8/49, 1♀.

EULOPHIDAE

*[*Cirrospilus vittatus* Walker Saltings, 15/7/52, 1♀.]

Aprostocetus caudatus Westwood W., 20/7/48, 12/7/52. [Lane, 17/7/52; Saltings, 15/7/52.]

MYMARIDAE

**Polynema gracile* (Nees) M.M., 3/6/50, 17/6/47; PH., 15/8/49, 21/6/51; W., 19/6/51. [L.B.D., 18/6/51.]

**P. fumipenne* Haliday W., 18/6/47, 1♀.

**Anagrus incarnatus* Haliday W., 15/7/52; M.M., 3/6/50.

**Ooctonus heterotomus* Foerster PH., 15/8/49; M.S., 13/7/52; W., 15, 15/7/52.

‡*Lymaenon fossarum* Hincks (1952, *Journ. Soc. Brit. Ent.*, **4,** 64) D., 17/8/49, 1♀ type.

‡*L. alecto* Debauche (1948, *Mem. Mus. Hist. Nat. Belg.*, **108,** 105), W., 12, 15/7/52, 1♂, 1♀.

‡[*L. rhacodes* Debauche (1948, *loc. cit.*, 97) Lane to Saltings, 17-18/7/52, 1♀.]

Lymaenon sp. This is the commonest species of the genus at Spurn and I would have expected it to be *L. litoralis* (Haliday). Unfortunately Haliday's description would apply to several British species and no information is given regarding the antennal characters. No specimens are now extant in Haliday's collection in the Dublin Museum so that we must turn to Foerster (1847) as the first reviser. He provides a more detailed description including antennal characters, and these appear to accord with the interpretation of Haliday's species adopted by Debauche (1948). The Spurn series clearly do not agree with the *L. litoralis* of Debauche nor do they appear to belong to any species included in his excellent paper.

PROCTOTRUPOIDEA

Proctotrupids are not so numerous in individuals or species at Spurn as the Chalcids, but at least 50 species have been taken during our visits. Several are of considerable interest, but the taxonomy of the group is even more obscure than that of the Chalcids so that many species must be omitted from our list. For instance, in the Ceraphrontidae, a family often parasitising aphids, we have failed to identify any of our material satisfactorily. The Proctotrupidae on the other hand has been revised recently by Nixon and we have been able to work out all our specimens with the aid of his paper. Most of the identifications of this super-family have been made by Mr. S. Shaw for whose help I am particularly grateful.

PROCTOTRUPIDAE

**Exallonyx niger* (Panzer) F., in seaweed, 15/6/47; PH., 21/6/51; M.M., 20/7/52. [Saltings, 7/6/50; Lane, 17/7/52.] The specimen from the Marsh Meadow is brachypterous, but appears to belong to the present species. As far as I am aware brachyptery is not recorded in this species though it is known to occur in one or two species of the family.

**E. microcerus* Kieffer M.H., 16/8/49; sea cliff, 14/7/52; W., 16, 19/7/52. [Saltings, 20/6/51; Lane, 17-18/7/52.]

†*E. longicornis* (Nees) PH., 21/7/52, 1♀; W., 12/7/52, 1♂.

*[*Paracodrus apterogynus* (Haliday) Lane to Saltings, 17/7/52.]

†*Proctotrupes gravidator* (Linnaeus) W., 15/6/47, 1♀; M.R., railway lines, 16/6/47, 1♂.

†*Phaenoserphus viator* (Haliday) Sea cliff, 13/7/52, 1♀.

†*P. calcar* (Haliday) W., 12/8/49; D., 14/8/49; M.M., 3/6/50.

DIAPRIIDAE

†*Spilomicrus basalyformis* Marshall M.M., 18/6/51, 20/6/51, ♂♂; D., 20/6/51, 1♂; sea cliff, 12/7/52, 1♀, probably this species.

SCELIONIDAE

†*Hoplogyron pedestris* (Nees) PH., 5/6/50.

†*Paragyron algicola* Kieffer M.H., 16/6/47, 23/6/51; S.M., 20/7/48; PH., 15, 20/8/49. This identification appears to be correct and our specimens agree with Kieffer's keys and descriptions. It appears to be known only from the original material taken in the Isle of Wight in seaweed on the shore.

PLATYGASTRIDAE

**Inostemma boscii* (Jurine) W., 14/7/52. [Lane to Saltings, 17/7/52.]

XI. HYMENOPTERA ACULEATA

S. SHAW

It has been mentioned in the introduction to the Hymenoptera report that Spurn is a good locality for collecting bees and wasps. It is, however, inevitable that this list is incomplete owing to the fact that our visits to the peninsula were restricted to a limited period of the season and that rather too late for the spring species. In addition, only a few members of the Spurn party have collected material of this Order. Even so, the total of 88 species represents one-third of the recorded Aculeates of Yorkshire, and the distributional range of many species has been extended into V.C. 61.

Mr. W. D. Hincks is responsible for collecting many of the species in the following list and I would like to thank him for his help and for naming all the Dryinidae and Bethylidae.

Mr. H. Inglescent has prepared an appendix to this report which deals with the parasitic organism *Nosema apis* (Zander) at Spurn.

DRYINIDAE

†*Dicondylus bicolor* (Haliday) 1♀ (var. a), M.S., 13/8/49, 14/7/52; 1♀ (var. b), PH., 20/8/49.

†*Pseudogonatopus distinctus* (Kieffer) Marram by railway lines near S.M., 16/6/47, 1♀; W., marram, 16/6/47, 1♀; M.H., 21/6/51; M.S., 14/7/52, 1♀.

†*Gonatopus sepsoides* Westwood W., marram, 3♀♀, 13, 15, 16/6/47; M.H., 4♀♀, 22, 23/6/51, 1♀, 19/8/49; marram by railway near S.M., 1♀, 13/8/49. [Saltings, 1♀, 17, 18/7/52.]

†*Neogonatopus lunatus* (Klug) M.H., 1♀, 23/7/48. [L.B.D., 1♀, 21/6/47.]

†*Anteon ephippiger* (Dalman) M.M., 1♂, 17/6/47; W., 1♂, 14/7/52. [Saltings, ♂♂, 16, 18/7/52.]

**A. lucidum* (Haliday) S.M., 1♂, 19/7/48; M.H., 1♂, 15/7/52; M.M., 1♂, 16/7/52. [Saltings, 1♀, 10/6/50.]

†*A. kieffieri* Chitty [Saltings, 1♀, 17, 18/7/52.]

**A. cameroni* Kieffer W., 1♀, 17/7/48; S. Cliffs, 1♀, 14/7/52. [Saltings, 1♂, 17, 18/7/52.]

BETHYLIDAE

**Bethylus cephalotes* (Foerster)! All females. PH., 15/8/49; M.M., 3/6/50; Railway, marram near S.M., 13/8/49; M.R., sweeping *Senecio*, 13/8/49; W., 17/7/48, 14/8/49, 16/6/51, 23/6/51.

Bethylus fuscicornis (Jurine)! All females except one male from W., 14/7/52; W., 17/7/48, 23/7/48, 14/7/52; Scrub near S.M., 16/6/47; F., 5/6/50; S. Cliffs, 13/7/52. [Saltings, 17, 18/7/52.]

CHRYSIDIDAE

Two species of rubytails, *Chrysis ignita* (L.) and *C. ruddi* Sch. are common on the Warren. They were particularly conspicuous in the cottage garden where they could be seen resting on the cottage walls during sunny periods, disappearing as soon as a cloud covered the sun. The two species of *Hedychridium* were not so evident and were mostly taken by searching sandy areas where they fly close to the ground amongst the marram grass. It is of interest to note that the Sphecids, *Astata boops* (Schrank) and *A. stigma* (Klug), the recorded hosts of these two cuckoo wasps, *H. roseum* (Rossi) and *H. integrum* (Dahl.), have not yet been observed at Spurn.

**Hedychridium roseum* (Rossi) W., 17/7/48; F., 19/6/51. [Saltings, 17/7/52.]

†*H. integrum* (Dahlborn) [Saltings, 17/7/52.]

Chrysis ignita (Linnaeus) W! 16/6/47, 23/7/48, 11/6/50, 16, 21/6/51, 12/7/52.

**C. ruddii.* Shuckard, W., ! 4-9/6/50, 16-19/6/51.

FORMICIDAE

Myrmica ruginodis Nylander M.R., 24/6/51; S.M., 19/7/48.

M. scabrinodis Nylander W., 17/7/48, 12/6/50, 17-23/6/51, 12, 19/7/52; S. Cliffs, 18/6/51; M.M., 20/6/51; S.M., 19/7/52.

Lasius niger (Linnaeus) W., 19/7/52; S.M., ! 19/7/52 under stones.

L. flavus (Fabricius) S.M., ! 19/7/52 under stones.

Formica fusca Linnaeus W., ! 20/7/48, 14/8/49, 12/6/50, 21, 23/6/51.

POMPILIDAE

The following two species of spider wasps are abundant at Spurn. The first, *P. plumbeus* (F.) being the commonest species in June, its place being taken by *E. rufipes* (L.) in July. Several species of the red-bodied Pompilids occur at Spurn, but owing to the difficulties of specific determination no names are yet available for this list.

Pompilus plumbeus (Fabricius) M.R., Marram; F.; S. Cliff; W.; S.M.; 6!!, 7! common in all the sandy areas. [Lane, Kilnsea, 17/7/52, with prey, *Pirata piraticus* Clerk.]

Episyron rufipes (Linnaeus) W.; M.R.; S.M., 6!, 7!! [Lane, Kilnsea, 17/7/52.]

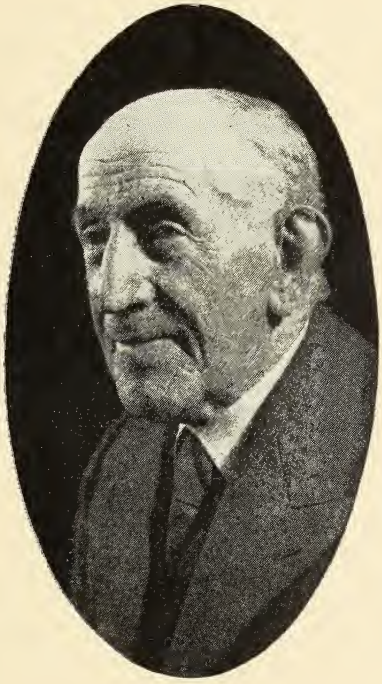
(*To be continued*)

Obituary

W. E. L. WATTAM
(1872–1953)

William Edward Locking Wattam was born in Oldham in 1872, but in early years was brought to Huddersfield. There he did his life's work and there he died in his 81st year. In 1946 he retired from his post as managing clerk to Messrs. Cartwright and Fieldhouse, solicitors, having then given sixty years' service to the law. He was in addition clerk or deputy clerk to the Marsden Council for twenty-five years. He never married.

By his frequent excursions in his own district and county Wattam came to have a full knowledge of Yorkshire natural history and on at least one occasion, in 1910, he travelled more widely and visited that happy hunting ground for botanists, the



West of Ireland. He may be said to have embodied in his own person the rise of the Naturalists' Societies of the north of England, for he was a member of one of the oldest of them, the Huddersfield Naturalists' Society, and filled all the offices it had to offer. When in 1951 this Society celebrated its centenary many tributes were paid to his personality and to his long-continued work for the Society. He was also a devoted and reliable member and officer of the Yorkshire Naturalists' Union. Like many other naturalists of his era he was distinguished for the breadth of his interests. Though his work was chiefly botanical, the subjects of his contributions to *The Naturalist* included lepidoptera and other insects, and also birds and mammals.

In 1898 Wattam joined the Huddersfield Naturalists' Society and five years later joined the Y.N.U. In his second year as a member of the Union he took over from W. Denison Roebuck the important and laborious task of preparing the index

of *The Naturalist* and continued this work for forty-nine years until his death. Although he modestly disclaimed that the compilation was a strict index, yet the very full classification of the contributions by authors, subjects and counties enabled the best use to be made of the contents of this journal.

In 1911 Wattam was elected Joint Secretary of the Y.N.U. with the late T. W. Woodhead and he held this position until 1920 when, on Woodhead becoming President, both resigned the Secretaryship. As a token of appreciation at this time Wattam was presented by the Union with books, one of which was Smith's *British Lichens,* and also with a microscope. From this time, having been relieved of the responsibility for excursion and annual reports, he contributed a steady flow of articles and notes to *The Naturalist.* In these his main interests, which were botanical, soon became apparent. He was never primarily a taxonomist, but the life of plants fascinated him and he illuminated many a dim corner in the life story of our wild plants by transferring them to his garden and noting their growth at periods when it is not seen by a less persistent observer. It was typical of him, for example, that on observing a dwarf form of the globeflower near Semerwater with plants only three and a half inches high bearing flowers, he took these plants home to his garden, where the production of flowering stems eighteen inches high in the following year proved that the dwarf character was due to environment, not heredity. Inevitably this interest in life histories led to a close examination of the seedling stages of plants and this became a favourite study of his. Few botanists knew so much about the usual period of germination of our wild plants in the field. When he took part in the Union's ecological survey of Moughton juniper he took over as his own special work the germination of juniper seeds, and his experiments on this, carried out in his garden and greenhouse, furnished valuable material for reports.

Wattam was a student at evening classes under T. W. Woodhead for eleven years and not only laid a foundation of accurate botanical knowledge, but caught from that pioneer of ecological studies the spirit of botanical ecology so that later he could not write of either flowering plants or lichens without describing them against the background of their habitats. It was in recognition of his ecological interests that he was elected chairman of the Ecological Committee of the Y.N.U. in 1948.

Another of his main interests was in lichens. His first contributions on this subject appeared in 1911 and his reports gradually became more frequent until in later life he gave detailed reports on the lichens found on all the excursions he attended. Referring to these an authority who knew his work writes: ' I cannot vouch for all his work, but consider that his contributions to *The Naturalist* were of great value.' A paper on the lichens of his home district appeared in *The Naturalist* a few days after his death.

Wattam also took a deep interest in the responses of plants to changing conditions of weather and season. To watch the pageant of the seasons and the variations of the years in their effect on plant life was his delight, and it was a fitting tribute to his many full and detailed contributions on this subject that he was made President of the newly-formed Phenological Section of the Y.N.U. in 1948.

Such a man could not fail to be a leader in his local Society and we know that he contributed numerous lectures to the Huddersfield Naturalists during his long life, led many rambles and exhibited at the Society's conversaziones. He was never happier than when guiding younger naturalists towards a knowledge and appreciation of nature. He did very good work during the establishment of the Tolson Memorial Museum and devoted much time to helping Dr. Woodhead in the provision and arrangement of the exhibits. This work he continued after Woodhead's death in conjunction with other Huddersfield naturalists.

Wattam was a modest, kindly and sincere man. In his services to natural history he never looked for special reward or recognition. It was enough for him to do his job well and he undertook even monotonous and unrewarding work as long as it advanced the studies he loved. All who worked with him came to recognise his character as reliable, friendly and enthusiastic, while those who came into close touch with him found his personality singularly attractive. By his death the Societies to which he belonged have lost a devoted supporter, and his friends mourn one whose place will be very hard to fill.

A.M.S.

BOOK REVIEWS

Zoogeography of the Sea, by **Sven Ekman.** Pp. xiii + 417. Translated from the Swedish by Elizabeth Palmer. Sidgwick and Jackson, London, 1953. 42/-.

This work is one of the publishers' textbooks of Animal Biology which have proved so valuable to the teacher and the student.

Zoogeographical textbooks have largely been concerned with terrestrial distribution, having occasional references to marine forms, and almost any contribution to marine zoogeography would be welcome. Ekman's book is not just 'any contribution': it is a most comprehensive and comprehensible treatment, illustrated with scores of distribution maps, hydrological maps, figures of organisms and statistical presentations of various sorts, reinforced with numerous tables relating to different matters. The reference list has not quite six hundred items covering an immense range of subject and extending as lately as 1950.

Quite apart from treating present distribution, it gives consideration to palaeoclimatology and palaeozoogeography well back into the Tertiary, thus enabling a better perspective of the coming of neozoogeography than would otherwise be possible. The intimate relation between organism and environment indicated in this book brings about a fuller description of the medium than might be thought necessary in a work on terrestrial zoogeography. We find ourselves dealing with hydrological matters up in the recesses of the Baltic Sea and in the depths of the abyss, we examine the conditions on the continental shelf and in the shallow seas. The depths of the oceans and the currents there are considered as barriers or aids to distribution. There is, indeed, an immense amount of material well thought out, well arranged and well documented.

Although the Northern Hemisphere is most intimately treated, especially the North Atlantic region and its extensions, yet the Antarctic seas are well reported. It is in such a work that the reader becomes aware of the considerable knowledge of the southern oceans, particularly arising through the activities of the Discovery Investigations Committee. In reading the section on the Abyss, one thought of the results yet to come out from the *Galathea* expedition, lately ended, to study the deep bed of the oceans.

Zoogeography of the Sea is recommended to all those interested in Marine Zoology, whether as teachers or as students, as good reading matter and as a mine of ordered information.

E.P.

Social Behaviour in Animals with special reference to Vertebrates, by **N. Tinbergen.** Methuen's Monographs on Biological Subjects. Pp. 150 with 8 half-tone plates and 69 line illustrations. 1953. 12/6.

Animal Sociology is a very young science. Here for the first time, in a small book, is a balanced presentation of the subject. It is not an exhaustive treatment but rather is it the author's intention to describe how investigations may be carried out and what approach may be expected to give the most valuable results. The style is lucid and the whole treatment of the subject stimulating; so stimulating in fact that one feels like setting up an aquarium forthwith to watch the nesting behaviour of sticklebacks all over again, but this time experimentally, using models of a male stickleback to try to entice the female to the nest and spawn ! The author wisely insists, and every field naturalist will endorse this, that an intimate knowledge of the lives of the animals is vital to a full understanding of any one feature of their behaviour.

The author interprets 'social' in its widest sense, including for instance the mutual reactions of only a pair of animals should this involve co-operation. Clearly we cannot expect to interpret adequately the highly complex and subtle relationships in the maintenance of the highly specialised societies of the social insects, for example, until we know the principles governing the behaviour of more simple groups. Mating behaviour, family life and fighting are treated in some detail first. It is in this field that the greatest advances have been made in recent years, and from which the concept of releasers has emerged. This concept, that animals react to sign stimuli presented by other individuals, was initiated by Lorenz and has been greatly developed by the author himself. There follows a brief general treatment of social organisations.

Apart from stressing the approach to problems of social behaviour, the author presents the various features of behaviour in the context of the whole life of the

animal and so tries to estimate the ' purpose ' or function of any behaviour pattern in the group life of the species. This and a chapter on evolutionary aspects will make this book of particular value to students.

Dr. Tinbergen finally points out that the study of animal behaviour is a field in which professional biologists have only recently entered, and that it is a field in which the ' amateur ' can contribute valuable studies in the future. The final chapter is devoted to hints on research problems, which could well be tackled by anyone with experience of field observation.

E.B.

Finding Nests, by **Bruce Campbell.** Pp. 256, with 40 photographs. Collins, London, 1953. 12/6.

The need for instruction and advice in finding nests has, of late, become insistent and the ornithologist will warmly welcome this most helpful book. The study of bird behaviour demands a close observation of the relation of a bird to its nest, whether in the rôle of a nestling or that of an adult exercising parental care. The practice of bird-ringing, designed to enable the future movements of a bird to be traced, requires the discovery of a number of nests each breeding season, in order that the young may be ringed in the short period during which they may safely be handled before they leave the nest. Thus the attention of the bird-watcher tends to become more and more concentrated upon nests and their contents.

Hitherto there has been a tendency on the part of the expert nest-finder to guard the secrets of his craft lest they should be overheard by that destructive predator the egg-collector; but now that the illegal and futile practice of egg-collecting has fallen into disrepute, the technique of nest-finding can be freely discussed and this is done very adequately in this unique volume.

No one is better qualified to deal with this subject than Dr. Bruce Campbell of the B.T.O., who has nest finding in his blood. It has long been practised in his family with great success and such skill as he has not inherited he has learnt from personal experience. He has also had the advantage of being able to consult the vast accumulation of MS. records compiled by the late Arthur Whitaker who, during sixty seasons, found occupied nests of 186 species of birds breeding in Britain and left detailed notes on no less than 21,620 individual nests. The book is therefore full of useful advice and instruction which cannot fail to be of great value, alike to the novice and the expert.

To watch the author himself at work gives the impression that climbing is an easy and effortless exercise combining agility with grace; but this is an illusion and the beginner will do wel lto give heed to every one of the writer's warnings before attempting to imitate him in wandering amongst the nests of a rookery or scaling impending crags in search of sea-birds' sites.

But the object of this book is not only to help the reader to reach the nest when found, but to instruct him as to when, where and how to find it, and this is very clearly done in Part I, chapter 2, where ' Methods of Nest-finding ' are very fully explained. In chapter 3, entitled ' Looking at Nests ', the writer, amongst other matters, stresses the care which should be exercised to prevent any risk to birds and their offspring, and particularly the necessity for removing any unavoidable traces of disturbance of the nest and its surroundings which might betray its presence to a possible predator. Part II deals with each species separately; its distribution in the British Isles, the season during which its nest should be looked for, the habitat which it frequents, the normal site and appearance of the nest are all described, followed by advice as to how the nest itself can be most rapidly located. This last subject is of the greatest value, as the reader is given so much helpful and original information based upon the author's personal experience and successes.

The book is illustrated by forty excellent photographs by various well-known photographers showing the breeding habitats and the nests of several typical species.

G.W.T.

Search for the Spiny Babbler: Bird Hunting in Nepal, by **Dillon Ripley.** Pp. 300 with Map. V. Gollancz Ltd., London, 1953. 14/-.

The writer of this book is an Assistant Professor of Zoology and Associate Curator of the Peabody Museum of Natural History at Yale, U.S.A. He has travelled in several Asiatic countries in search of birds and has an expert's knowledge of the Indian species. In this book, written in 1951 but not published in this country

until now, he describes an expedition which he made to Nepal in 1948 with the object of collecting specimens of little known birds, such as the Spiny Babbler, and of tracing the distribution in Nepal of species already known in India. Most of Nepal is still an inaccessible *terra incognita* and up to that time few white men had been permitted to set foot in it and none had been given leave to explore its mountain fastnesses; but Ripley so far succeeded in interesting the native government officials in his work that he was allowed to enter the country at three separate points and to penetrate into the interior as far as he cared to go. The writer gives a very graphic and fascinating account of the progress and adventures of his party on its arduous journeys over previously unexplored country. He faithfully describes the people whom he met, the conditions under which they live, the scenery of the country and its fauna and flora. In view of the fact that, since the time of Ripley's visit, restrictions on foreign travel in Nepal have been somewhat relaxed, as witness the fact that recent expeditions to Mount Everest have been allowed to pass through it, this book is of particular interest, as it describes conditions which are rapidly passing away and will soon be forgotten. Ripley notes the growing impact of civilisation on the people and their country. Though the capital, Katmandu, could not be reached by wheeled traffic, owing to the steepness of the intervening mountain passes, motor cars were already running in its streets and electric power and lighting had been installed. He describes how the narrow primeval forest belt is being systematically cleared by Indian lumber companies. Regeneration being impossible this results in serious and rapid erosion of the soil and loss of cultivable land on the lower slopes. The effect of such changes on the bird life of the country is already considerable.

This book is far from being a treatise on the avifauna of Nepal: it is a travel book, and the collecting of specimens is only one of its themes. For that reason it will interest a wide circle of readers, while it will whet the appetite of ornithologists for more information about the country's birds and further details on the problems of distribution that the expedition set out to solve.

Unfortunately this edition is without illustrations, though many photographs and films were taken by the party. However, the scenery and people are so vividly described and the day-to-day activities of the explorers are related in so lively a manner that the omission is scarcely noticed. G.W.T.

Feathered Outlaws, by **Nancy Price.** Pp. 128 with 19 photographs by leading bird photographers. Henry E. Walter, Ltd. 7/6.

Classical legend, country tradition and superstition, and gamekeeper's natural history are mingled with modern observation, partly in the form of dialogues between the author and a mysterious ' Bird Man ', an old-style gamekeeper, and an observant young bird-lover. Is the word ' outlaw ' more suitably applied to birds such as owls that are protected by law than to gamekeepers who still destroy them? Despite some anthropomorphisms the book is decidedly readable, and offers an opportunity to meet in another ' part ' one who has delighted many of us through another medium of artistic expression. A few remarks need to be taken *cum grano salis.*

R.C.

Collecting Bumble Bees, by **T. B. Poole.** The Amateur Entomologists' Society ; Leaflet No. 25. Pp. 20, with many figures. Obtainable from C. B. Pratt, 1 West Ham Lane, London, E.15. Price 2/1½ post free.

The ' A.E.S.' continues its valuable work of assisting the beginner in entomology by the publication of useful leaflets on collecting methods and related matters. The present leaflet by Mr. Poole is a particularly helpful one dealing with our British Bumble Bees (the genera *Bombus* and *Psithyrus*), those attractive insects of our gardens and fields which collectively are known to all naturalists but specifically to very few. After some brief introductory notes the bulk of the pamphlet is devoted to tabulated descriptions of all the British *Bombi* and *Psithyri* (queens, workers and males), profusely illustrated by sketches showing the disposition of the coloured bands, and to artificial keys for identification. Based on simple and easily observable characters the latter certainly work, at least for the ten or so species with which we have so far tried them out. This leaflet will supply a long felt need as the literature for identifying Bumble Bees is either out of date, out of print, or very technical.

W.D.H.

Ants, by **Derek Wragge Morley.** Pp. 179 with 15 plates, 169 figures, and 27 distribution maps. The New Naturalist Monographs series. Collins, London, 1953. 18/-.

This book presents the British ants in a way that will be greatly welcomed by the general naturalist and entomologist. The author does not claim to give a detailed treatment, but he does competently summarise modern knowledge of the subject. The chapters on ' the ants of the garden ' and ' Experimenting with ants ' are based largely on the author's own studies and are likely to generate some enthusiasm among readers, while the chapters on collecting, growth and anatomy adequately present the basic information that the student will require.

The book is intended to stimulate the study of ants and it should achieve its purpose. A key to the species is provided, based on Donisthorpe's key, and each point is illustrated by a line drawing that gives a good impression of the character used, and will be of great assistance to the novice. Unfortunately an error (printer's?) in bracket 6 (Worker) where the reference numbers have been transposed, will cause the novice a certain amount of trouble.

A chapter is devoted to descriptions of the species, with habits, habitats and general distribution. Distribution maps are provided for each species, and these are the more valuable for indicating whether the species is abundant, common, or represented by scattered or individual records. The author does not agree with the validity of the splitting of various species, and while the keys run down to the sub-species, the distribution maps lump them together, which is rather a pity.

The author was right to avoid too many technical terms in a book intended to have a general appeal, but sometimes he simplifies his writing too much, and writes as though his readers were still in the second form. And was it worth while to produce English names for all the species? Do they not confuse rather than ease the task of the novice while proving an irritant to the more experienced entomologist? But these are minor criticisms, and the book deserves to be well received and is a useful addition to the *New Naturalist* series.

J.H.F.

Lesser Worlds, by **Nesta Pain.** Pp. 252, with illustrations by J. Yunge Bateman. Longman's, Green and Co., London, 1953. 10/6.

A pleasant diversion for those whose tastes do not incline to entomology, this might fittingly be sub-titled ' Insects for the Home Service.' It is based on those B.B.C. features which the author has written and produced, and which are entirely founded on the works of several eminent naturalists, Fabre figuring prominently. Here is nothing that is new, but Miss Pain has selected from her sources those items most calculated to astonish and intrigue the reader, and the result is a lively, quickly-moving narrative covering several species of spiders, beetles, bees, wasps and ants.

The author has clearly ranged widely among books, but her acquaintance with insects is not apparent, and entomologists will be surprised to learn that ' few people have made beetles their favourites. Fabre is the one outstanding exception . . .' The process of brightening also has its pitfalls, and the statement that the predaceous water beetles dive to the bottom ' hugging little air bubbles to their chests ' reveals that the author can never have seen a Dytiscid in the water.

J.H.F.

Butterfly Farmer, by **L. Hugh Newman.** Pp. 208, with 68 black and white photographs. Phoenix House, Ltd., London, 16/-.

This is a book which cannot fail to fascinate anyone who professes an interest in the Lepidoptera. It is not a textbook though it has advice for those who can take the hint, and it is not an autobiography, though personal reminiscences naturally occupy pride of place.

Mr. Newman starts by telling the story of his butterfly farm and of its initiation through the efforts of his father, the late L. W. Newman, which alone constitute a great adventure. He gives a readable account of the problems which beset such work and of the rather surprising uses to which his specimens are put. The author then ranges further afield to describe what are literally ' Lepidopteran pursuits ' and he will without doubt raise a great deal of envious admiration among the average collectors, tied to weekends and a fortnight's holiday, by his opportunities to pursue a particular prize in its favourite locality at its optimum time. In other chapters the names of insects, the travels of famous specimens through the salerooms

and finally that most controversial of topics, the reintroduction of species to certain localities, are entertainingly discussed by the author.

The book is beautifully and appropriately illustrated, and one finishes it with a feeling that the author is thoroughly in tune with his occupation and well qualified to discuss it.

J.H.E.

Journey into Wonder, by **N. J. Berrill, F.R.S.** Pp. 320, Gollancz, 1953, 13/6.

This is an account of the great voyages which opened up the world, from Columbus's crossings of the Atlantic to the Antarctic expeditions of Shackleton and Scott. As would be expected in a book by Dr. Berrill, the emphasis throughout is on the zoological observations and achievements of the famous men whose journeys he so graphically describes. The gallery of celebrities includes John Hawkins, Drake, Richard Hawkins, William Dampier—perhaps the most colourful and picturesque character of them all—Forster and Cook, Humboldt, and Charles Darwin. As observers of marine animals and birds, their records were at first made more as navigational aids or signs of the proximity or remoteness of land, but Richard Hawkins' vivid descriptions of sea animals presaged the change of outlook which was to follow when the animals became of interest in themselves and the study of natural history began. The contributors to the ever growing body of knowledge have been as diverse as the nature of their contributions, from Dampier, that strange compound of lawless buccaneer and acute observer of wild life, to Darwin, the studious and industrious young intellectual.

This is a stimulating book, for Dr. Berrill writes with a vigour and enthusiasm which matches the grandeur of his theme. As a marine zoologist he is able to assess the significance of some of the observations made and conclusions reached by the voyagers concerned, though his dismissal of the *Kon-Tiki* ' myth ' may well be premature in view of Heyerdahl's most recent exploit.

W.A.S.

Unto The Fields, by **D. W. Gillingham.** Pp. 286. Museum Press, London. 17/6.

Richard Jefferies has had many imitators but here is a book with the true apostolic ring. Its author was born near London, spent his early youth in Canada and returned, some years before the war, to a part of Essex still unreached by the ever-swelling excrescences of the Great Wen. Whether or not his innate perceptiveness was heightened by the contrast with the wider horizons of the New World is uncertain but his acuity is the hall-mark of his work. Like Jefferies, he is content to draw his material from the day to day life of a few fields and it is adequate to his purpose. Like Jefferies, too, his style is uneven, sometimes faltering, sometimes inspired by his evident love for the earth which offers escape from the constricting coils of an urban existence, but one is always conscious that his aim is higher than reportage.

Again, he is in conflict with philistinism and sometimes with himself for inveighing against fox-hunting when he can see no better way of killing foxes—if foxes must be killed. He views with anguish the eventual and inevitable overwhelming of his little kingdom by the ever-sprawling, spreading monster which is Greater London and he sees what escapes so many, that the pace of life quickens upon us all the time without compensation, without purpose, save for providing leisure to be frittered profitless away.

Gillingham seems to be a naturalist in the fullest sense of the word and his descriptive passages will be read with nostalgic delight by many to whom his message will come as to the converted. It is less likely that he will achieve a wider reputation in this day and age which has ceased to pay even lip service to the contemplative mood.

E.H.

Handbook of Basic Microtechnique, by **Peter Gray.** Pp. viii+142 with 57 figures. Constable and Co., 1953, 12/6.

This book covers the basic procedures in the preparation of stained mounts for microscopical examination, i.e. fixation and fixatives, stains and staining methods, dehydrating and clearing, mounts and mountants, whole mounts, smear preparations, section cutting, and labelling and storing slides. Its aim is to present this information in as concise, practical and readily accessible a manner as possible, divested of the theoretical background to the subject and the numerous references

and special methods which both increase the size and cost of a more comprehensive treatise whilst at the same time decreasing ease and speed of reference.

The matter includes the information required by students and technical workers for most ordinary purposes though there is no account of celloidin embedding. Pitfalls to be avoided and sources of trouble in cutting microtome sections are described. In the second part of the book fifteen specific examples of preparing and staining slides of different material commonly required in zoological and botanical work, and illustrating different methods, are fully described.

British Wild Flowers, by **John L. Blair.** Pp. 239 with 80 full colour plates and many drawings. W. and R. Chambers, London & Edinburgh, 1953. 21/-.

The publishers state on the cover of this book that it is a handbook of all the wild flowers likely to be seen in the British Isles and that easy identification tables are given for these. That the book falls far short of these claims is at once clear when it is noticed that no mention of sedges and grasses occurs, that only three species of Speedwell are mentioned, only three of St. John's Worts and a single Forget-me-not.

The author's somewhat crude attitude to classification is indicated by two of his statements. After describing the Slender St. John's Wort he remarks: 'There are several other varieties of St. John's Wort all closely resembling the one described here!' In reference to the Enchanter's Nightshade, he says: 'It is classed as a *sub-species* of the Willow-herb family though it has characteristics peculiarly its own.'

The table of Families turns out to consist of descriptions much too brief to form any adequate basis for correct classification and the Easy Identification Tables consist of classification by flower colour, time of flowering and habitat alone, with no reference to morphological characters. Plant identification by this book will therefore resolve itself into a comparison of the plant gathered with the illustrations provided. One hundred and two species are shown in coloured plates which reach a high level of excellence and which constitute the chief value of the book. The numerous illustrations without colour are also good on the whole.

Some errors have been noted, e.g. the Spindletree is given as belonging to the Crassulaceae, the Moschatel to Araliaceae and the Alsinaceae are classified among the Monocotyledons, while the definition of dioecism includes monoecism also. The few pages of herbal lore and folk lore of flowers will interest some readers.

A. Malins Smith.

Trees in Britain. Filmstrip No. 6079. Yevonde production distributed by Educational Productions Ltd., London and East Ardsley, 25/-.

This is a strip of 22 frames in colour illustrating some British trees in summer and winter condition and the uses to which the wood is put. The teaching notes give further detail and are very helpful, though there is an unfortunate reference to the Cricket *Ball* Willow ! It must also be emphasised that the willow is essentially insect pollinated. Nevertheless the filmstrip is of considerable value for school use, the several frames portraying well the seasonal characteristics and habits of the trees illustrated.

J.H.E.

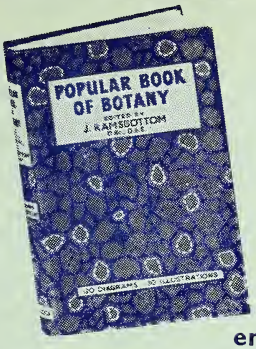
Dawn Song and All Day. May 1953. Bird Research Station, Glanton, Northumberland. Pp. 10. 1/6.

Details are given of Dawn and Dusk Choruses as heard on April 13th and September 21st, 1952, in many parts of the world, with diagram. Following discovery of abnormal plumage in young Song-Thrushes and Blackbirds hand-reared at Glanton, an attempt is to be made to survey the natural distribution of abnormally plumaged birds, and to study such experimentally—by improper feeding?

R.C.

How to Choose and Use Field-glasses, by **J. R. Hebditch.** Pp. 12. Revised edition enlarged from original edition by E. M. Nicholson. B.T.O. Field Guide No. 2 (Revised), 2 King Edward Street, Oxford. 1953, 1/-.

The original edition of this useful guide was published three years ago. The text of the present edition whilst following the same lines as its predecessor has been substantially enlarged and includes a very useful table of leading British makers of binoculars giving full optical details and prices.



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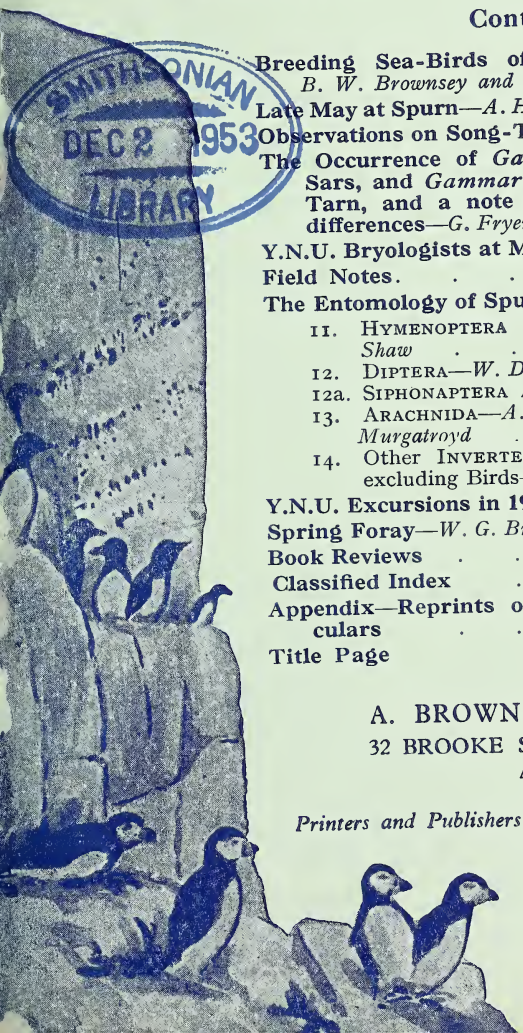

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BREEDING SEA-BIRDS OF FLAMBOROUGH HEAD

B. W. BROWNSEY AND D. B. PEAKALL

During the three days, June 21st to 23rd, 1952, we visited Flamborough Head with the intention of obtaining an indication of the number of sea-birds there. The count was conducted along the cliffs from Bridlington to Speeton Bay and the method employed was that of counting from one buttress the number of birds on the face of the opposite buttress, species by species. Due to the fact that not all of the cliff face could be seen, the length of hidden cliff face was recorded and it was found that this amounted to only 3½ per cent. No checking was carried out as it was found that the whole of the three days was required to carry out the count over six or so miles of cliff.

The figures obtained represent the 'apparent' breeding population of each species. This 'apparent' breeding population would equal the actual breeding population if the only birds on the cliff were breeding birds, and if only one bird of each breeding pair was present. The number of birds on the cliff would then be the actual number of breeding pairs present, but in practice such ideal conditions do not exist and other birds, both breeding and non-breeding, will be included in the count. Thus the figure obtained is larger than the actual breeding population and is referred to as the 'apparent' breeding population. No account was taken of birds in the air, and in the case of the auks a count was made of those on the sea. Due to the fact that it was impossible to see all of the cliff face, the figures obtained have had to be increased by 3½ per cent. and are as follows:

Species	No. on cliff	No. on sea
Gannet (*Sula bassana*)	5	—
Fulmar (*Fulmarus g. glacialia*)	310	—
Herring Gull (*Larus a. argentatus*) ...	710	—
Kittiwake (*Rissa t. tridactyla*)	17,600	—
Razorbill (*Alca torda britannica*)	1,240	340
Guillemot (*Uria aalge albionis*)	7,150	1,700
Puffin (*Fratercula arctica grabae*)	460	370

Both Cormorants (*Phalacrocorax c. carbo*) and Shags (*P. a. aristotelis*) were seen, but were not included in the count.

In the case of the Puffin, which nests in burrows, crevices and holes and therefore could not be seen during the count, the number of birds seen on the cliff does not give an indication of the breeding population. It will be noticed that in both the case of the Razorbill and the Guillemot the ratio of birds on the cliff to those in the water is approximately four to one.

If the assumption is made that this ratio can be applied to the Puffin, the number on the cliff becomes approximately 1,500. By subtraction from this figure of the number of Puffins actually seen on the cliff, the number of birds in their nesting holes is in the neighbourhood of 1,000.

Although it will be seen that both on the cliff and in the water the Razorbill is less numerous than the Guillemot, the former always appeared to be commoner in flight. A count gave the ratio of flying Razorbills to flying Guillemots as seven to three, a figure that appeared to be typical.

On June 22nd a Fulmar was noticed to have a chick which had the appearance of being about ten days old. This is an early date to see a young Fulmar, the shortest period of incubation given in the *Handbook of British Birds* being forty days and thus the egg must have been laid as early as the first week in May.

Owing to the scarcity of definite figures of the numbers of sea-birds breeding in this area, changes of population through the years are difficult to assess. Gannets have been seen here since 1924. The first definite evidence of breeding was in 1937 when one egg was taken; since 1939 the population has been approximately constant at four pairs. The Fulmar first bred in 1922. In 1939 there were under 100 pairs breeding in the East Riding of Yorkshire and there has therefore been a considerable increase during the last decade. As regards the other species, we have been unable to find any definite figures. Both Wade in *Birds of Bempton Cliffs* and Nelson in *Birds of Yorkshire* state that 130,000 Guillemot's eggs had been taken in a year. Nelson also states that the maximum number of eggs laid by a Guillemot during a year is three, and thus if every egg laid was collected, the population must have been 43,000 pairs. From this we must conclude that either the figure of 130,000

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eggs per year is considerably exaggerated or the population is now only a sixth of what it was at the beginning of the century. That a decrease has occurred is stated by Chislett in his recent book *Yorkshire Birds*, and he gives collecting and oil pollution as the main causes. He also states that the numbers of Razorbills have decreased, although not to the same extent, due it is thought to the nesting ledges being more inaccessible to climbers. It is to be hoped that effective measures will be taken to ensure that this decrease does not continue.

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[Without accurate counts from the seaward side it is doubtful if even rough approximation has been reached by the figures cited. Nevertheless, counts made in the future under similar limitations should yield trustworthy results in a comparative sense and be of real value in indicating general trends.—Ed.]

LATE MAY AT SPURN

A. H. B. Lee, P. H. Saunders

A Visit to the Spurn Bird Observatory cannot be expected, at the end of May, to produce the fascinating spectacles of early spring and late autumn, but there is always a chance that conditions may produce something unusual. Nevertheless we found our short stay very fully occupied and were not disappointed by the number of birds we ringed and retrapped. Many that we ringed were probably resident birds which will provide interesting information in the event of recapture. It was still a little early for many young birds of the year to be seen.

Birds of the wader-type are rarely captured at the Point owing to difficulties of siting traps, caused by the tides. Ringed Plover, however, nest on the peninsula in considerable numbers and some of the young are ringed each year. The handling and ringing of the young birds need particular care, and should not be done until they are well grown. There appeared to be a very small trickle of Swallows moving through, and one evening, Cuckoos were more numerous, possibly indicating a small passage. Weather conditions were probably unsuitable for migration, with a moderate north-westerly wind blowing most of the time.

A visit to the Point showed that the Little Terns were nesting in some numbers. In the past these nests have suffered from over-publicity but following a careful survey, we found that the Colony has maintained its numbers surprisingly well. After dividing the area into strips, we examined the ground carefully, and found a total of 50 nests containing 101 eggs. Twenty-nine nests held two eggs, eleven held three, and ten only one egg. Obviously, clutches were not all fully completed. No chipped eggs or young were found.

It was noticeable that, where the nests were near the marram grass, the eggs were laid in scrapes along the margins of these marram areas, and only occasionally inside the grass belts, or on the open sand. Away from the marram, other nests were less closely distributed among pebbles, mainly in areas where there were fewer large stones. In the area between the dunes and the high-water mark, we found nests in sand and among small and medium-sized stones and pebbles. Higher up towards the dunes, where the sand was darker and more coarse, and with few stones, there were very few nests, though several empty scrapes were seen. All scrapes were unlined and the distance between the nests naturally varied considerably. The closest together were approximately ten yards apart.

Many birds could be seen flying out to, and in from, the sea. Those flying in sometimes carried small silvery fish and, after raising their wings almost vertically over their backs on alighting, moved towards their nests with wings often slightly drooped. In some cases, the brooding bird advanced from the nest to accept the fish, and in others, the bird was fed on the nest whilst incubating.

At the time of this survey the tides were higher than normal and some loss of nests was inevitable. One nest at the Point had been washed but the eggs remained

in place. Two other pairs had nested half-way down the peninsula on the sea side, and both nests were unfortunately destroyed by the tide—in one case the bird attempted to brood the eggs between each successive wave which swept over them, but eventually they were washed away. Another pair nested on the Humberside near the Chalk Bank, but this was robbed, very probably by Carrion Crows which were often seen quartering the beach.

At least two other Little Tern's nests were found, with eggs, on the sea coast of the northern part of the peninsula, well above high water. In this area where the fresh breeze blew along the beach and raised flurries of sand, the Tern's flight was striking. Whilst in the neighbourhood of the nest and before alighting, the bird almost hovered when flying into wind, though the typical undulating body motion remained. The flight was effortless and the wind troubled them little.

Two Common or Arctic Terns were flying among the Little Terns at the Point and one was seen to alight on the sand among them. The Arctic Tern has been known to breed there once (1939).

The Ringed Plover is well distributed around the beaches of the peninsula and at least ten nests were found in two days. They ranged from one-egg nests to clutches of four. Most nests were among pebbles and, though decorated with small stone and shell chippings, were unlined, but two were found among the rocks of the Chalk Bank and one, quite thickly lined with bents, was among grass in the dunes. One nest was placed among flood wreckage (hay, grass, pieces of wood and other flotsam) in the middle of the peninsula, alongside the road.

The ' distraction displays ' of the Ringed Plover were seen to great advantage. These became more violent in cases where the young had hatched, the birds approaching to within four or five yards. The tail was dropped and fanned out, and one or both wings partially spread, the bird almost crawling away among the stones. Of a pair, one bird was usually more courageous than the other, and gave a more realistic ' broken-wing ' display at a closer range; this was probably the female. The alarm note was constantly uttered and occasionally evoked a faint response from the young birds.

After hatching, the young blend amazingly with their surroundings and were difficult to find unless they showed themselves by movement. They were, however, rapidly found by the returning parents who could be seen brooding them.

Few other waders were seen in any numbers. Small parties of Dunlins and nimble Sanderlings, still in winter plumage and possibly non-breeding birds, were feeding along the high-tide line. Turnstone were also present in small numbers but were more content among the seaweed.

Despite the warning notices erected by the War Office, there are considerable numbers of visitors to the Point at week-ends, mainly bait-diggers and fishermen, who are too preoccupied to be any threat to the nesting birds. Most holiday-makers fortunately appear to ignore both birds and nests, but the number of footprints, particularly among the Little Terns' nests, illustrate the dangers.

Again we have been grateful to the Yorkshire Naturalists' Union and the Spurn Bird Observatory Committee, for another enjoyable and instructive week-end at the Point. The amount of work we were able to do, at the end of May, shows that the late spring has its attractions, even though passage migration may be only slight.

Mr. G. H. Ainsworth writes: As usual, the beginning of the season gave every indication that the Little Tern Colony at Spurn would flourish but events in June and July had such effects on the birds that although the site of the colony was visited many times during these months, by several competent observers, in order that the young birds might be ringed, only one young Little Tern was seen—' and that on the wing ! '

Several Magpies were seen taking the eggs and were apparently unperturbed by the swoopings and cries of the parent birds. Many empty eggs were found. They had been sucked.

As A. Lee and P. Saunders point out, holiday-makers and fishermen appear to ignore the birds—but the presence of these people keeps the birds off the eggs. Several visitors have dogs with them which roam about the ternery and, naturally, are attracted to the eggs and young. This state of affairs has been going on now for some years. Many eggs are laid but very few young have been reared. This cannot go on much longer and unless vigorous measures are taken to make Spurn a Nature Reserve we shall have no Little Terns nesting there before so very long.

The Spurn Committee is doing everything possible to persuade the East Riding County Council to take some action and these efforts of the Spurn Committee have the backing of the Nature Conservancy Board, the local Member of Parliament and several influential people in the Riding. Perhaps we shall not be too late to prevent the destruction of the flora and fauna at Spurn—but time is running low !

FIELD NOTES

An Unusual Nest of the Dormouse (*Muscardinus avellanarius* Linn.). On May 30th, 1953, Dr. J. G. Harrison and I were assisting in the Grey Squirrel campaign in Kent. A long aluminium pole in sections was being employed to turn out squirrel dreys in tall trees in the Mildmay woodlands, near Shoreham, Kent.

A large drey was found about forty feet up in a pine tree. The tree was situated in a mixed deciduous and coniferous woodland extending over several acres and with relatively little undergrowth. When this drey was disturbed with the pole a small animal was seen to fall out of it. It fell all the way to the ground in a horizontal position with the legs splayed out and the tail straight out behind. It landed on ' all fours ' and immediately tried to climb up the tree again. We caught it and were astonished to find that it was an adult female Dormouse. The animal died after a few days in captivity but when it was prepared it showed no sign of injury from its prodigious fall. It was found to be pregnant with four separate gestation sacs in the right uterine horn, each containing a small embryo about seven millemetres crown-rump length. The left horn contained no pregnancies.

The Dormouse had evidently been using the disused squirrel drey as a breeding nest. I have never heard of such an occurrence before, and it has prompted me to make a search in the literature to see if there are any similar records. Barrett-Hamilton (*A History of British Mammals*, Part 14, p. 364) mentions that in Sussex, Mr. Cocks found a mouse occupying a nest, apparently of a Magpie, twenty feet up in a spruce fir. Millais (*The Mammals of Great Britain and Ireland*, Vol. 2, p. 168) mentions that Mr. F. H. Birley discovered the nest of a Dormouse in a woodpecker's hole in an oak and also that a nest has been found high up in ivy clinging to a large oak.

We turned out about thirty dreys during the afternoon, but no other Dormice were found. The Dormouse is certainly not common in the Sevenoaks district.—David L. Harrison.

Unusual Fish-louse in Yorkshire.—On November 18th, 1952, my niece, Miss Dorothy Smith, brought me a Crustacean which had been removed from a gold-fish in a small aquarium in her school. I sent it to Dr. W. Ritchie of Bradford Technical College who gave me its generic name as Argulus, but recommended that it should be sent to the British Museum for identification of the species. Dr. Ritchie pointed out the striking adaptations for its parasitic life possessed by Argulus viz; flattened shape, paired sucking discs for attachment to the host and piercing mouth parts.

Dr. J. P. Harding of the British Museum named the specimen *Argulus foliaceus* L. He added ' Your specimen differs from any British or European specimens of *A. foliaceus* L. that I have ever seen, except for one or two others also from goldfish, in having a carapace which reaches far enough to cover half of the abdomen.'

This specimen had been taken out of the Leeds and Liverpool canal at Gott's Park, Armley and was seen actively swimming in the school tank for a day or two. A gold-fish was then placed in the tank and the fish-louse soon settled on the goldfish. It was very striking that, when brought to me after being brushed off the goldfish, it kept up an incessant and rapid swimming activity. This habit will no doubt help it to find a new victim.

Mr. H. Whitehead has informed me that he knows of no published records of this species in Yorkshire. He has however had some unpublished records in a letter from Mr. G. Fryer, who writes; ' I have seen plenty of specimens from the Huddersfield district, having taken it swimming free and from a pike in the canal.'

In view of the absence of published records, I have thought it worth while to put this find on record, It may serve to draw attention of freshwater biologists to the genus Argulus and so lead to a fuller recording of its occurrence and distribution. It may well be known to anglers, though they probably would not know its scientific name.—A. Malins Smith.

OBSERVATIONS ON SONG-THRUSHES

K. G. SPENCER

In January 1948 I began what I hoped would be a detailed life-history study of the British Song-Thrush (*Turdus e. ericetorum* Turton), but because of human interference the project had to be abandoned after less than four months' work. The following are the few brief notes resulting from the observations I made. The study-area was twenty acres in extent, comprising a park and private gardens alongside it at Burnley, Lancashire. Topographically, it appeared ideally suited to Song-Thrushes, consisting of broad lawns and sections of deciduous woodland with ample 'edging' of rhododendrons and similar bushes.

Several birds were already singing from established song-posts when I began my study in the first week of January. No detailed observations were made on song, but it was obvious that it was at its best under mild, humid conditions. A spell of frost on February 25th and 26th silenced all the Thrushes except one, which had been the first to start singing after the winter hush (for in this district mid-winter song is not usually maintained so continuously as the *Handbook of British Birds* chart suggests it is elsewhere). These observations, fragmentary though they are, nicely confirm the conclusions of Alexander (*Report of the Bird-Song Enquiry organised by the British Trust for Ornithology*, *British Birds*, vol. xxxvi, pp. 65-72, 86-92, 102-109).

A central communal roost in thick rhododendrons was used by Song-Thrushes on the area throughout the period surveyed, even though some had to fly over several territories to get to it. Possibly the birds with the nearest territories retired first, thus leaving the way clear for later arrivals from more outlying parts, but this was never proved. Birds were always very noisy when going into the roost, calling with the metallic Blackbird-like chattering and flicking their wings and tail in a nervous and excited fashion. Often, just before entering the bushes, individuals would fly rather restlessly from one high perch to another, singing, and I got the impression that these pre-roosting songs were more hurried, harsher, and less far-carrying than normal. If disturbed after they had gone to rest, the birds flew out silently. The roost was rather exposed on the western side, and on April 7th, when a strong west wind swept across the area, it was shifted to a more sheltered position a hundred yards away, the old site being resumed on or before April 18th.

Several birds, noticeably shy in contrast to the residents, appeared in the area on February 25th and 26th. They used the communal roost on both these evenings, but were not present on the 27th. At about the same time, or shortly after, there was an influx of breeding-birds, numbers gradually increasing from the mid-winter total of about six, to twenty or more. Pair formation took place very suddenly and simultaneously between March 14th and 19th, and, once together, the birds habitually went about in very close company. Nine of the eleven males on the area secured mates, mostly during these few days, and thereafter they dropped very silent, seldom singing except in the dawn and dusk 'choruses'; by contrast, the song-output of the two unmated males was not noticeably diminished. Parallel behaviour has been recorded in certain other species (*vide* Lack, *Life of the Robin*, 1943).

A careful survey in mid-April showed that there were, as expected, eleven territories on the twenty acres, with several small areas totalling some two acres unoccupied for no obvious reasons. There was no great variation in size between any of the holdings. On a study-area in Finland, Siivonen (*Ann. Zool. Soc. Zool.-Bot. Fenn. Vanamo*, 7 (i), 1-289) finds territories of the Continental Song-Thrush, *Turdus ericetorum philomelus* Brehm, extend between $3\frac{3}{4}$ acres and $14\frac{3}{4}$ acres, but cites Schiermann's observations on others as small as one acre. On March 23rd, one bird was seen to leave its territory and go into an unoccupied area to attack a Tawny Owl, *Strix aluco*.

Several cases of aggressive display were seen, the usual procedure being for two birds to make crouching runs at one another, though occasionally real sparring fights did take place. Whilst engaged in one mild skirmish on a territory border, two birds were seen to snatch and eat earthworms during momentary lulls in the clash. (It has sometimes been questioned whether birds picking up food as a displacement activity in such circumstances do actually consume it.)

Displays which might have been either aggressive or sexual were twice seen. On the first occasion a bird sang whilst perched within a few inches of another, inclining its bill vertically and, perhaps, swaying its body as a Robin does. Unfortunately, the behaviour was interrupted by passers-by. In the second instance,

the performer sang softly with a squeaky, hurried warble, elongating its neck forwards and moving it sinuously whilst drooping its wings slightly and shivering them. As it displayed, it moved around its companion, which kept quite still. The behaviour continued for about two minutes before the quiescent bird flew off, the other then stopping its display and beginning the ordinary sub-song. I suspect that sexual display amongst Song-Thrushes usually takes place in the early morning.

Nests were destroyed by town urchins and hooligans even as they were being built, so that study of breeding behaviour was practically impossible. I did notice, however, that in the making of one nest it was one bird alone (? female) which did most, if not all, of the gathering of material, though its mate accompanied it closely on all the foraging journeys.

Birds of Mexico, a Guide for Field Identification, by **Emmet Reid Blake,** illustrated by Douglas E. Tibbitts. Pp. xxx+644, with 329 drawings. Published by University of Chicago Press and obtainable from Cambridge University Press, 1953, 45/-.

The avifauna of Mexico is remarkable for its richness in species and extraordinary variety. In part this is a reflection of the geographical position of the country and its great diversity of climate, topography and vegetation. Over 750 resident species—about 80 of them endemic—and 200 migrants represent a total which greatly exceeds that of the United States and Canada combined. There are in addition some 2,000 geographical races. Of the 89 families occurring in the country, Flycatchers, Tanagers, Humming-birds, Wood-warblers and Woodpeckers are particularly richly represented. This book is designed especially for the use of American ornithologists visiting Mexico, its primary aim being to supply a portable guide for field identification. The sequence of families follows Wetmore and the dichotomous keys to the birds of each family are based on the most readily discernible field characters. The descriptions of adult species are followed by a summary of the Mexican distribution and enumeration of the geographical races. These are listed with their known areas of occurrence but without descriptions since critical examination of series of specimens is usually essential for certain identification. The remarks which conclude the treatment of each species give information on the type of habitat in which each is found, conspicuous diagnostic characters are emphasised and italicised, and comparisons drawn with superficially similiar species. More than a third of the species are admirably illustrated, either wholly or in part, to show field characters of diagnostic value. The drawings are the work of the staff artist of the Chicago Natural History Museum where the author is Associate Curator of Birds.

A remarkable amount of information is condensed within the pages of this beautifully produced volume which will surely be indispensable for visiting ornithologists for many years to come.

A Sanctuary Planted, by **Walter J. C. Murray.** Pp. 191, one coloured plate and 32 pages of photographs. Phoenix House Ltd., London, 1953. 15/-.

The author, having decided to transform about an acre of rough grassland into a nature sanctuary by the work of his own hands, describes in detail how he sets about this self-imposed task.

After much thought a plan was drawn up and it was decided to lay out two paths to form an oblique cross and to centre a circular path roughly about their crossing point. These, together with a further path divided the area into eight irregular parts each of which was intended to make its appeal to different wild creatures. These several areas became the Rookery, Chestnuts, Birches, Thicket, Sallow, Bees, Heath and Wilderness. Much information is given relating to the choice of shrubs and trees planted in the various sections and throughout the book the writer's delight and enthusiasm in his work are clearly evident.

From the very commencement the author decided to keep a daily log of progress and a list of the birds, animals and insects noted either as residents or visitors. The sanctuary has now been in existence for fourteen years and fifty-eight species of birds and more remarkable still twenty-three species of animals, reptiles and amphibians have been observed within its boundaries.

All who are interested in the creation of sanctuaries or in laying out a garden with the object of attracting wild life, should obtain a copy of this most helpful book.

E. W. T.

THE OCCURRENCE OF *GAMMARUS LACUSTRIS* G. O. SARS, AND *GAMMARUS PULEX* (L.) IN MALHAM TARN, AND A NOTE ON THEIR MORPHOLOGICAL DIFFERENCES.

G. FRYER

More than a year ago I was able, through the kindness of Mr. P. F. Holmes, to examine a number of Amphipods from Malham Tarn. All the specimens which he sent on this occasion had been collected near the centre of the Tarn, and all were referable to *Gammarus lacustris* G. O. Sars. This discovery was of considerable interest for, although this species, whose presence in Britain was made known only in 1940 by Reid, has now been found to be widespread in Scotland and has also been reported from Wales and Ireland, it had not previously been recorded from any English locality. Indeed a careful search in the Lake District has so far failed to reveal its presence there. Since its discovery in Malham Tarn however, Dr. H. B. N. Hynes informs me that he has found it in Hatchmere, Cheshire.

As all the specimens in the collection from Malham Tarn belonged to this species it was at first thought that *G. lacustris* replaced the common *G. pulex* (L.) in this locality, but an examination of further collections sent to me by Mr. Holmes revealed that this is not the case and that both species occur there. Later I was able to visit Malham Tarn myself and make collections of Amphipods from a number of stations along the north and east shores. Analysis of these collections revealed that along these shores *G. pulex* is the predominant species; *G. lacustris* occurring

Second and third epimeral plates of **A**—*Gammarus lacustris*, **B**—*Gammarus pulex*
Both drawn from specimens from Malham Tarn.

in only a few of the collections and comprising only about six per cent. of the total catch. Of the six stations from which the latter species was taken, four of them were the four in the shallow sheltered bay at the north-east corner, from which I had already received specimens from Mr. Holmes and where *G. pulex* also occurs, and one of the other two was the sheltered non-stony bay at the north-west corner.

Such ecological data as I was able to accumulate under rather trying conditions during my brief visit are naturally insufficient to enable me to specify the type of microhabitat favoured by *G. lacustris* but I received the impression that it selects habitats where silt and organic sediment accumulate rather than more exposed, rocky situations. The occurrence of this species in the centre of the Tarn, where sheltered conditions prevail, and its virtual absence from exposed shores where *G. pulex* may abound, supports this contention and perhaps gives a clue which will be worthy of consideration when the comparative ecology and competitive relationships of the two species are studied. Observations made by Mr. Holmes since my visit are not at variance with this tentative hypothesis, but Dr. Hynes who has recently visited Malham Tarn and has collected both species from the south and west shores tells me that he has found nothing to suggest that this is so.

Much remains to done therefore towards the elucidation of the distribution and ecological preferences of the two species in Malham Tarn. It is hoped that some of the problems presented in the study of the ecology of closely allied species will receive the attention they deserve from visiting students, and it may be suggested that these two Amphipods serve as convenient and readily accessible material for such studies. A map showing the distribution of the two species within the tarn as far as is yet known has been deposited at the field centre.

To facilitate discrimination between the two species concerned, figures are given of the second and third epimeral plates of both species. The differences here apparent serve to separate individuals of either sex. It may be remarked that the armature of the epimeral plates is extremely variable, even to the extent of differing on the two sides of a single individual, but in general these plates are in *G. pulex*

armed with stout spines while those of *G. lacustris* are provided with long slender setae. In the case of the males, those of *G. pulex* are readily distinguished from those of *G. lacustris* as in the former species the flagellum of the antenna proper (*i.e.* the ' second antenna ') is somewhat swollen and is provided with a dense brush of setae, while no such modification is to be seen in *G. lacustris*. A brief description of *G. lacustris* is given by Reid (1940), and both it and *G. pulex* are identifiable by the use of the key given in the latter's synopsis (1944).

For record purposes it may be noted that *G. pulex* occurs in both the inflowing and outflowing streams of Malham Tarn and in the nearby Gordale Beck.

References

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Y.N.U. BRYOLOGISTS AT MACKERSHAW, RIPON

On March 28th five members of the Bryological section met at Whitecliffe, near Ripon and proceeded towards Mackershaw. The weather had been dry for some time and it was feared that this would make bryologising difficult, but a few showers just before the meeting had freshened things up a little; also much of the collecting was done on the banks of the River Skell, where conditions were still relatively moist. To begin with the ground was typical magnesian limestone scrubland. The most interesting find here was *Phascum curvicollum* Hedw., which was found in fair quantity and in prime condition on patches of bare earth. Other species seen in the same type of habitat were: *Pottia lanceolata* (Hedw.) C.M., *Aloina aloides* (Schultz) Kindb., *Barbula revoluta* Brid., *B. trifaria* (Hedw.) Mitt., and *B. tophacea* (Brid.) Mitt. At the base of the limestone cliffs, which were too dry in their upper part to support bryophytes, *Lophozia badensis* (Gottsche) Schiffn. was abundant.

Along the Skell banks members were interested to see a few flowers of *Gagea lutea* (L.) Ker-Gawl. blooming among the barren clumps of leaves and a comforting amount of *Carex digitata* L. was observed on the dry, rocky banks above the stream.

The bryological flora by the Skell was not luxuriant but there were a number of interesting species, particularly a *Fissidens*, which Mr. A. H. Norkett identifies as *Fissidens minutulus* Sull. ex Braith. non Sull. This species, Mr. Norkett says, has been wrongly interpreted in the past and may have to have a new name.

Conocephalum conicum (L.) Dum. was seen fruiting in abundance, antheridiophores also being present. Other hepatics seen included *Aplozia riparia* (Tayl.) Dum., *Lophozia badensis* (Gottsche) Schiffn., and *L. turbinata* (Raddi) Steph. Among the mosses noted were: *Distichium capillaceum* (Hedw.) B. & S., *Barbula trifaria* (Hedw.) Mitt., *B. fallax* Hedw., *B. spadicea* Mitt., *B. tophacea* (Brid.) Mitt., *Trichostomum tenuirostre* (Hook & Tayl.) Lindb., *T. sinuosum* (Wils.) Lindb., *Eucladium verticillatum* (With.) B. & S. c.fr., *Isopterygium depressum* (Bruch) Mitt., *Rhynchostegiella pallidirostra* (A.Br.) Loeske, *R. teesdalei* (Sm.) Limpr., *R. tenella* (Dicks.) Limpr., *Campylium protensum* (Brid.) Kindb. and *Hygrohypnum luridum* (Hedw.) Jennings. *Amblystegium compactum* (C.M.) Aust., which has been found at Fountain's Abbey, was searched for without success. Members were fortunate in the weather which although blustery and cloudy in the early part of the day, kept fine until everyone was safely back in Ripon.—J. Appleyard.

Fungi and the Grey Squirrel.—In Ilton Gill Wood on July 2nd, 1953, of several species of fungi that had made early appearances, only one appeared to be providing food for some animal. This was identified by W. G. Bramley as *Russula cyanoxantha* (Schaeff) Fries. Only the pileus was eaten. Here and there lay stalks entirely bare, usually with a few fragments of pileus scattered nearby. Speculating as to the cause I passed from the wood to return an hour later, when I looked over the boundary wall at a Grey Squirrel on the ground only four yards away, busily nibbling the pileus of a *Russula* and scattering fragments. The rodent continued to nibble for a full minute before pulling the remainder of the pileus from its stalk and passing to the nearest tree, up the bole of which it mounted leisurely, fungus in mouth, until lost to sight in the branches. The Grey Squirrel is numerous about Masham.—Ralph Chislett.

THE ENTOMOLOGY OF SPURN PENINSULA

(*Continued from page* 140)

HYMENOPTERA, ACULEATA (*continued*)

VESPIDAE

Odynerus spinipes (L.) is common on the Warren, where the characteristic curved projecting entrances to their nests are numerous on a clay bank at the end of the bird trap near the cottage, a site where many of the Spurn aculeates were taken. The remaining species, with the exception of *Ancistrocerus pictus* (Curt.), were scarce, the type of locality not being particularly suitable for their nesting habits. Social wasps of the genus *Vespula* do not seem to be present at Spurn, for during all the visits to the district no nests have been located, and only a single specimen of *V. rufa* (L.) was taken on the cottage window.

Odynerus spinipes (Linnaeus) W., ! 4, 9/6/50, 14, 16, 19/6/51.
Ancistrocerus parietum (Linnaeus) W., 1♂, 17/6/51 (W.D.H.).
A. pictus (Curtis) M.R., 16/6/47, on flowers of Umbelliferae; F., 16/6/47; M.M., 17/6/47; S.M., 21/6/47; W., 7, 11/6/50.
A. parietinus (Linnaeus) W., 1♀, 10/6/50 (W.D.H.).
Vespula rufa (Linnaeus) W., 1♀, 21/8/49 (W.D.H.).

SPHECIDAE

Seventeen species of Sphecids have been taken at Spurn, the majority of which occur within a few yards of the cottage. The two species of *Crossocerus* were often to be seen in numbers on Sycamore leaves in the cottage garden. Two other species, *Crabro peltarius* (v. Schr.) and *Solenius continuus* (F.) are abundant on the Warren in June and July on flower heads. The prey of these insects consists of various species of Diptera, and as this order is well represented in species and individuals it is only to be expected that Sphecids are abundant. Among the less common species of the area it might be worthy of mention that a single specimen of the parasitic wasp, *Nysson dimidiatus* Jurine, was taken, as was its host, *Harpactus tumidus* (Pz.).

Whether or not *Clytochrysis cavifrons* (Thoms.), a species which preys on Syrphid flies, is actually living on the peninsula is perhaps in doubt, as the only specimens taken were three, reared from pupae found in a log on the seashore. The remains of numerous specimens of Syrphids were found in the log together with the pupae. It might be that the log had been carried down the Humber and round the Point to be deposited on the seashore. There was a previous instance of this kind, at Spurn, when Cardinal beetles were found in a log which had been washed up on the beach (cf. Coleoptera report).

Tachysphex pompiliformis (Panzer) W., 17/7/48, 14/7/52.
†*Trypoxylon attenuatum* Smith W., 1♀, 19/7/52 (S.S.).
Ammophila sabulosa (Linnaeus) W., ! 9/6/50; S.M., 16/6/47. [Lane, Kilnsea, 17/7/52.]
**Cemonus shuckardi* Morawitz W., ! 18, 23/7/48, 10, 11/6/50.
Oxybelus uniglumis (Linnaeus) W., 19/6/47, 25/7/48; S.M., 16/6/47, 1♀ with prey, *Fannia armata* (Meigen) (det. H. Britten). [Lane, Kilnsea, 17/7/52.]
Crabro cribrarius (Linnaeus) D., 19/6/47; W., 17/7/48, 12/7/52.
C. peltarius (von Schreber) W., ! 20/7/48, 7/6/50, 21/6/51.
Ablepharipus podagricus (van der Linden) W., 1♀, 23/7/48 (W.D.H.).
Crossocerus tarsatus (Shuckard) Near S.M., 18/6/51; W., ! 17/7/48, 11/6/50, 17/6/51.
C. wesmaeli (van der Linden) W., 18/7/48, 9/6/50. [Lane, Kilnsea, 17/7/52.]
†*Clytochrysis cavifrons* (Thompson) Pupae ex log on seashore, 7/6/50, 1♂, 2♀♀ em. 21/6/50.
Solenius continuus (Fabricius) W., ! 17/6/47, 20/7/48, 10/6/50, 19/6/51, 12/7/52; M.S., 18/6/47; S.M., 21/6/47; M.R., 16/6/47.
†*Entomognathus brevis* (van der Linden) W., 1♂, 14/7/52 (W.D.H.).
†*Nysson dimidiatus* Jurine W., 1♀, 23/7/48 (W.D.H.).
†*Hoplisus quadrifasciatus* (Fabricius) W., 20/7/48. [Lane, Kilnsea, 15/7/52.]
Harpactus tumidus (Panzer) W., 1♀, 15/6/47, 1♂, 20/7/52.
Mellinus sabulosus (Fabricius) [Lane, Kilnsea, 17/7/52.]

APIDAE

The list which follows is probably less representative of the actual number of species to be found at Spurn than are the previous lists of Aculeata, although the

total number of Apidae collected is 30 species. Only a relatively few specimens of such genera as *Andrena* and *Halictus* were taken in a limited part of the season, thus leaving obvious gaps in the picture. Further collecting is also necessary in the genus *Sphecodes*, only one species of which I can record with certainty, although one or more species occur within the area. Two species of *Andrena* which have not been taken at Spurn during our visits are mentioned in the 'Aculeata Hymenoptera of Yorkshire' (*Nat.*, 1930-32) by R. Butterfield and W. J. Fordham, as occurring at Kilnsea. They are *A. fulvago* (Christ), Kilnsea, 22/7/28, R. Butterfield, and *A. coitana* (Kirby), Kilnsea, 7/28, R. Butterfield.

An interesting case of Phoresy was noted by Mr. W. D. Hincks when he captured a specimen of *Bombus distinguendus* Mor. Attached to the tip of its proboscis was the beetle *Antherophagus pallens* (Fabricius), a species which is frequently found in bees' nests. This specimen must have been waiting on some flower head in order to attach itself to a bee and so be carried into its nest.

A short list below, of hosts, parasites or inquilines, which is founded on published records, is given to indicate more clearly the relationship between the various species of bees as far as is possible from the material collected on the peninsula.

HOST	PARASITE
Colletes fodiens (Geoffroy)	*Epeolus variegatus* (Linnaeus)
Halictus rubicundus (Christ)	*Sphecodes monilicornis* (Kirby)
Andrena jacobi Perkins	*Nomada marshamella* (Kirby)
A. nigroaenea (Kirby)	*N. goodeniana* (Kirby)
Megachile willughbiella (Kirby	*Coeloxys quadridentata* (Linnaeus)
	C. elongata Lepeletier & Serville
M. circumcincta (Kirby	*C. elongata* Lep. & Serv.

HOST	INQUILINE
Bombus terrestris (Linnaeus)	*Psithyrus vestalis* (Geoffroy)
B. lucorum (Linnaeus)	*P. vestalis* (Geoffroy)
B. lapidarius (Linnaeus)	*P. rupestre* (Fabricius)
B. hortorum (Linnaeus)	*P. barbutellus* (Kirby)

Colletes fodiens (Geoffroy) W., on *Senecio* flowers, 13/8/49, 12/7/52. [Lane, Kilnsea, 13/7/52.]
Halictus rubicundus (Christ) W., 11/6/50, 14/7/52; M.H., 2/6/50; 8/49, plentiful in all areas, H. Inglescent.
H. calceatus (Scopoli) W., 19/8/49; M.M., 21/8/49; PH., 13/8/49.
†*H. villosulus* (Kirby) M.M., 12/6/47; S.M., 16/6/47; W., 13/7/52.
**H. nitidiusculus* (Kirby) M.M., 14/8/49; M.H., ! 3/6/50, 18/6/51; W., 16/6/51.
H. rufitarsis Zetterstedt W., M.R., S.M., M.M., 8/49, fairly plentiful, H. Inglescent.
H. smeathmanellus (Kirby) W., 15/7/52 (W.D.H.).
H. leucopus (Kirby) M.M., 10/6/50, W., 14/7/52.
**Sphecodes monilicornis* (Kirby) W., 1♀, 3/6/50 (W.D.H.).
Andrena haemorrhoa (Fabricius) W., 1♀, 14/6/50 (W.D.H.)
†*A. carbonaria* (Linnaeus) W., 9, 10, 11/6/50.
**A. cineraria* (Linnaeus) 8/49, plentiful in all areas, H. Inglescent.
A. nigroaenea (Kirby) W., 11/6/50, 17/6/51.
A. jacobi Perkins W., 9/6/50, 16/6/51; M.H., 18/6/51; W., S.M., M.M., 8/49, fairly scarce, H. Inglescent.
A. fucata Smith M.M., 8/49, scarce, H. Inglescent.
A. clarkella (Kirby) 8/49, plentiful in all areas, H. Inglescent.
A. barbilabris (Kirby) W., 1♀, 23/7/48 (W.D.H.).
A. chrysosceles (Kirby) W., 1♀, 19/6/51 (W.D.H.).
Anthophora acervorum (Linnaeus) W., 1♂, 11/6/50, 2♀♀, 22/6/51.
A. furcata (Panzer) W., 1♀, 24/7/48 (W.D.H.).
Epeolus variegatus (Lnnaeus). [Lane, Kilnsea, 17/7/52 (W.D.H.).]
**Nomada rufipes* Fabricius W., 1♀, 14/7/52 (W.D.H.).
N. goodeniana (Kirby) W., !! 7, 10, 14/6/50, 16, 17/6/51.
N. marshamella (Kirby) W., 9, 11/6/50.

Megachile willughbiella (Kirby) M.S., 18/6/47; M.R., on flowers of Umbelliferae, 16/6/47.
M. circumcincta (Kirby) W., ! 12/6/47, 10/6/50, 16, 21/6/51, 14/7/52.
M. centuncularis (Linnaeus) W., 1♂, 20/7/52 (W.D.H.).
†*M. versicolor* Smith M.M., 8/49, scarce, H. Inglescent.
**Coelioxys quadridentata* (Linnaeus) W., 17/6/47, 21/7/52.
C. elongata Lepeletier & Serville W., ! 17/7/47, 13/7/48, 11/6/50, 19/6/51, 12, 14/7/52.
Osmia rufa (Linnaeus) W., 1♂, 9/6/50 (W.D.H.).
Bombus terrestris (Linnaeus) W., 17/6/50, 17/6/51; W., M.R., M.M., 8/49!, H. Inglescent.
B. lucorum (Linnaeus) W., M.R., M.M., 8/49!, H. Inglescent.
B. lapidarius (Linnaeus) M.M., scarce, 8/49. H. Inglescent; W., 1♀, 7/6/50 (S.S.).
B. pratorum (Linnaeus) W., M.M., 8/49, scarce, H. Inglescent; W., 23/6/51 (S.S.).
B. ruderatus (Fabricius) W., 9/6/50, 14, 19, 24/6/51, all the melanic form.
B. hortorum (Linnaeus) W., M.R., S.M., M.M., plentiful, 8/49, H. Inglescent.
B. distinguendus Morawitz W., 11/6/50, 19/6/51, carrying *Antherophagus pallens* (Fabricius), on the apex of its proboscis (W.D.H.).
**B. sylvarum* (Linnaeus) W., 17/8/49, 7/6/50, 19/6/51.
B. agrorum (Fabricius) W., M.R., 8/49, H. Inglescent; W., 7/6/50, 17/6/51.
B. muscorum (Linnaeus) W., M.R., M.M., 8/49, H. Inglescent; W., 9/6/50, 16/6/51
B. humilis (Illiger) W., 25/7/49, on *Epilobium* flowers.
Psithyrus rupestris (Fabricius) W., 24/7/48, 13/8/49, on flowers of *Senecio*; M.M., 8/49, H. Inglescent.
P. vestalis (Geoffroy) W., 1♀, 9/6/50 (S.S.).
P. barbutellus (Kirby) [Lane, Kilnsea, 18/7/52 (S.S.).]

APPENDIX ON THE NOSEMA DISEASE OF BEES

H. INGLESCENT

During August 1949 I collected and dissected a number of wild bees with a view to discovering whether any were infected by the protozoan *Nosema apis* (Zander). The disease has been prevalent in the honey bee (*Apis mellifera*) for a considerable period and it seems reasonable to assume that it might also be present in wild bees though no work appears to have been done hitherto on this line of enquiry.

It was thought that the Spurn peninsula might be good ground for a survey since honey bees were probably absent, thus eliminating a possible source of contagion although information on the aetiology of the disease is scanty.

Prior to the Spurn visit examinations of 84 bees of various species have provided only five instances in which *Nosema* was found to be present. The positives were three *Bombus terrestris*, one *B. pratorum* and one *B. lucorum*. At Spurn specimens of the following species were collected and dissected: *Halictus rubicundus* (Christ), *H. rufitarsis* Zetterstedt, *Andrena cineraria* (Linnaeus), *A. jacobi* Perkins, *A. fucata* Smith, *A. clarkella* (Kirby), *Megachile versicolor* Smith, *Bombus terrestris* (Linnaeus), *B. lucorum* (Linnaeus), *B. pratorum* (Linnaeus), *B. hortorum* (Linnaeus), *B. agrorum* (Fabricius), *B. muscorum* (Linnaeus), *B. lapidarius* (Linnaeus), *Psithyrus rupestris* (Fabricius).

Only in three cases out of 57 dissections were positives found, namely two *P. rupestris* and one *B. hortorum*.

The life cycle of the disease organism is as yet unknown but, since it is a parasitic protozoan, direct contact is an unlikely source of contagion. It seems clear from the above results that the genera *Bombus* and *Psithyrus* are not immune to *Nosema apis* and it is possible that the whole of the family Apidae may be prone to infection.

Incidentally, during the dissection, the larva of a Conopid fly was found in the abdomen of a specimen of *Bombus terrestris*.

I wish to express my thanks to my colleague, Mr. H. Cropper, microscopist to the Cheshire Bee Keepers, for confirming the occurrence of *Nosema* at Spurn, and to Mr. H. Britten for help in identifying the bees.

XII. DIPTERA

W. D. HINCKS

The Diptera has been the least collected major order of insects during our Spurn visits. It was not until 1951 and 1952, when Mr. K. G. Payne joined the party, that a competent dipterist was present. During earlier visits Mr. Shaw and the

writer had merely taken a few of the more obvious species while collecting other orders. As a result the present report, though it owes much to Mr. Payne's two visits, gives a very inadequate picture of the large dipterous fauna which exists on the Peninsula. Individually flies are the commonest insects at Spurn and probably the total number of species is even greater than that of the Hymenoptera. Many Diptera are less affected by adverse weather conditions than are the Hymenoptera and Lepidoptera so that even on unfavourable days they were quite plentiful on the wing and could be netted or swept from the vegetation. It is hoped that advantage of this fact will be taken by entomologists making short visits to Spurn in the future and that many additions will be made to our preliminary list. Indeed some additions were made in July, 1953 but it has not yet been possible to complete their identification and they must await the projected ' Additions and Corrections ' to the present report.

Flies in general are distributed throughout the Peninsula though some families such as the Trypetidae are associated with special food-plants and many groups are restricted to particular ecological conditions which may only occur in one or few spots. Little can yet be said however in regard to the distribution of most species on the Peninsula, beyond the data included in the list. During our earlier collecting of this order it was necessary to restrict our material merely to one or two specimens as indicating the presence of a species at Spurn.

Several families of flies, because of their fragility, or particular habits, demand special techniques for successful collecting. Such families have been almost entirely neglected but are indicated in the report in the hope that students will endeavour to fill in the gaps in the future.

Much of the material for the following list has been provided by Messrs. K. G. Payne and S. Shaw and thanks are due to them for the assistance they have given. Mr. L. N. Kidd has kindly helped with some of the identifications. The report includes 211 species.

TIPULIDAE

The Crane flies are very poorly represented at Spurn. Several small species however are not included in the list as the scanty material collected precludes definite identification.

Tipula unca Wiedemann W., 23/6/51, ♂.
T. oleracea Linnaeus W., 11/6/50, 19/6/51; M.M., 23/6/51.
T. paludosa Meigen W., 19/7/52, ♂♀; [Lane to Saltings, 17/7/52, ♀♀].
T. vernalis Meigen W., 9/6/50; 19/6/51, ♂, det. L.N.K.; M.M., 3/6/50; F., 23/6/51.
[*T. lateralis* Meigen Saltings, 17/7/52, ♂♂].
T. lunata Linnaeus W., 9/6/50, 19/6/51, ♂, det. L.N.K.; 23/6/51, ♀.
Nephrotoma maculata Meigen W., 5-9/6/50, 19/6/51, 14/7/52, ♂♂.
N. flavescens Linnaeus W., 14-23/7/52, an abundant species on the W. and elsewhere; 23/6/51, 5♂ 7♀.
[*N. quadrifaria* Meigen Lane to Saltings, 17/7/52, ♂].
Limonia autumnalis (Staeger) W., 19/6/51.
Erioptera (*Symplecta*) *stictica* Meigen An abundant species. D., 4/8/49; M.M., 23/6/51, 13/7/52; W., 4/6/50, 23/6/51; [Saltings, 15-17/7/52].

ANISOPODIDAE

Anisopus fenestralis (Scopoli) PH., 15/8/49; W., 14/7/52.
A. punctatus (Fabricius) W., 24/6/51; also commonly swept in various parts of peninsula.

PTYCHOPTERIDAE

Ptychoptera contaminata (Linnaeus) P.M.M., 18/6/51; [L.B.D., 18/6/51].

PSYCHODIDAE

These very delicate flies have not been collected at Spurn.

CULICIDAE

Only two species of mosquitoes appear to occur on the Peninsula but a careful search has not been made. Neither species has been particularly troublesome during our visits.

Aedes detritus Haliday PH., 13/8/49!; 6, 7/6/50; D., 14-17/8/49!; W., 25/6/51!
A. rusticus (Rossi) W., 3, 9/6/50!; 25/6/51.

CHIRONOMIDAE

Not collected but the most abundant species appears to be :

Chironomus riparius Meigen D., 4/6/50!, 17, 18/6/51!!; PH., 9/6/50; W., 19/6/51.

CERATOPOGONIDAE

Not collected. A species of *Culicoides* was occasionally a vicious biter near the cottage.

BIBIONIDAE

Dilophus febrilis (Linnaeus) W., 16, 19/6/51.

SCATOPSIDAE

Swammerdamella brevicornis (Meigen) An abundant and widely distributed species in 6 and 7, especially in W., PH., M.M. and M.R. On the latter it is particularly abundant on the flowers of *Senecio jacobaeae.*

Psectrosciara soluta (Loew) Sea cliffs, 13/7/52.

MYCETOPHILIDAE

Not collected. Few species occur at Spurn except perhaps for the Sciarinae.

CECIDOMYIIDAE

Not collected. Galls of *Cystiphora sonchi* were common on *Sonchus* leaves, F., 6/47. Adults were reared during the last week in June and the first of July.

STRATIOMYIDAE

Microchrysa polita (Linnaeus) W., 23/6/51; [Lane to Saltings, 16/7/52].

M. flavicornis Meigen W., 19, 23/6/51.

Geosargus cuprarius (Linnaeus) W., 12, 13/7/52.

Chloromyia formosa (Scopoli) W., 6, 7! [Saltings, 15, 18/7/52].

Stratiomys furcata (Fabricius) This is one of the interesting species of Spurn. D., larvae and pupae common in 6 and 7; a few adults in 6, fairly common but difficult to discover in 7 and 8. Adults also W., 7, 8; [L.B.D.; Saltings, 15/7/52].

Nemotelus uliginosus (Linnaeus) Crater in M.M., larvae common in 7; D., 6, 7, 8!; S.M., 7!; W., 7, 8!; PH., 15/8/49, 12/7/52; [Saltings, 15/7/52].

[*N. notatus* Zetterstedt Saltings, 15/7/52. This, and especially the previous species were present in extraordinary numbers on the Saltings, feeding at flowers].

RHAGIONIDAE

[*Rhagio scolopacea* (Linnaeus) Lane to Saltings, 17/7/52].

R. tringaria (Linnaeus) F., 13/7/52. It is rather strange that besides this specimen found on the shore, I have found the species on the seashore at Hunmanby, and in Devon (K.G.P.).

TABANIDAE

Chrysops relictus Meigen D., 19/6/47!; 18/7/48; W., 13/8/49; M.M., 15/7/52; Saltings, 15, 16/7/52.

C. quadratus Meigen W., 21/6/51, 1♂.

Haematopota pluvialis (Linnaeus) D., 18/7/48; W., 14/7/52. Clegs are not common at Spurn.

[*H. bigoti* Gobert Saltings, 15/7/52. Previous records of this species are mainly from the south and south-east of England. It is thought to be a salt-marsh species].

BOMBYLIDAE

Villa paniscus (Rossi) An interesting species. W., 7/48! in a small area near end of Heligoland trap; 14/7/52; PH., 15/8/49; [Saltings, 15/7/52].

THEREVIDAE

Thereva annulata Fabricius 6, 7, and 8, very abundant in marram areas and all along peninsula.

T. nobilitata (Fabricius) 6, 7, and 8, common but less so than previous species.

T. bipunctata Meigen W., 24/6/51.

ASILIDAE

Leptogaster cylindrica (Degeer) D., 18, 27/4/48!; W., 17/6/47, 12, 19/7/52; [Saltings, 18/7/52].

Dysmachus trigonus (Meigen) W., 6, 7, 8!; Railway lines near S.M., 16/6/47; [Saltings, 20/6/51, 15/7/52; Lane to Saltings, 17/7/52, with *Chloromyia formosa* as prey].

Philonicus albiceps (Meigen) D., 18/7/48, 17/8/49; W., 7/48, 7/52!; a male with a Muscoid as prey; Spurn Point, 19/8/49; M.S., 13/7/52; [Saltings, 16/7/52].

EMPIDIDAE

A number of species of this family occur at Spurn, some commonly, but owing to taxonomic difficulties it has not been possible to identify all the species taken. The list which follows is almost entirely the work of Mr. Payne.

Tachydromia arrogans (Linnaeus) M.H., 11/6/50; PH., 21/6/51; F., 23/6/51!

Platypalpus strigifrons (Zetterstedt) W., 23/6/51, 3♂ 2♀; Saltings, 15-17/7/52.

P. pallidiventris (Meigen) D., 17/7/52, 4♀♀; [Saltings, 16/7/52, ♀].

Hybos culiciformis (Fabricius) W., 14/7/52, 2♂ 2♀; PH., 19/7/52.

Ocydromia glabricula (Fallén) W., 24/6/51, ♂.

Hilara lundbecki Frey P.P.A., 23/6/51, ♂♀; S., 24/6/51, ♂, F., 24/6/51, ♀. According to Lundbeck this species is restricted to the seashore or to sandy places near it.

Empis (*Xanthempis*) *stercorea* Linnaeus W., 23/6/51, ♂♂.

E. (*X.*) *trigramma* Meigen W., 24/6/51, ♀♀; M.S., 13/7/52.

E. (*Pachymeria*) *femorata* Fabricius W., 16-23/6/51; S.M., 16/6/51.

E. (*P*) *tessellata* Fabricius Common everywhere, 6. 7, 8. A pair *in cop.*, W., 9/6/50, female carrying a male *Chilomyia honesta* (Rondani) as prey.

Rhamphomyia nigripes (Fabricius) W., 23/6/51, ♂♂.

R. maculipennis Zetterstedt S., 24/6/51, 1♂. Recorded at Spurn by Mr. Cheetham, 26/5/28.

Clinocera (*Hydrodromia*) *stagnalis* (Haliday) P.P.A., 19/7/52, ♂♀.

Dolichocephala irrorata (Fallén) W., 19/7/52, ♀.

DOLICHOPODIDAE

Many species of this family are exceedingly abundant in damp places at Spurn.

Dolichopus plumipes (Scopoli) W., 23/6/51, 14/7/52; PH., 9/6/50!; 21-23/6/51; [Saltings, 20/6/51, 15/7/52].

D. popularis Wiedemann M.M., 23/6/51, ♂.

D. sabinus Haliday W., 12/7/52, ♂; P.P.A., 12/7/52, ♂♂; Saltings, 15/7/52, plentiful. This is a salt-marsh species.

D. nubilus Meigen W., 14/7/52, ♂.

D. brevipennis Meigen PH., 21/6/51, 2♂♂; D., 17/7/52, ♂.

D. ungulatus (Linnaeus) W., 6/51!! Abundant in cottage garden.

Macrodolichopus diadema (Haliday) D., 17/7/52, ♂; [Saltings, 15/7/52, both sexes on the margin of a pool]. A salt-marsh species.

Poecilobothrus nobilitatus (Linnaeus) W., 12/7/52!

Hydrophorus oceanus (Macquart) S., 13/7/52, a number of both sexes on and round a salt-water pool on the shore. A seashore species.

H. praecox (Lehmann) P.P.A., 23/6/51, ♂; F., 23/6/51, ♂♀, 13/7/52, ♂♀; [Saltings 16/7/52, pond near sea]; D., 17/7/52.

[*H. litoreus* Fallén Saltings, 16/7/52, ♂, pond near sea].

H. bipunctatus (Lehmann) P.P.A., 12/7/52, ♀; D., 15/7/52, ♂.

Scellus notatus (Fabricius) W., 14/7/52!

Aphrosylus ferox Walker S., 13/7/52, ♀, on surface of a salt-water pool. The early stages of a member of this maritime genus have been recorded in barnacles.

Medeterus petrophilus Kowarz W., 12/7/52, 1♀.

M. petrophiloides Parent W., 14/7/52, 1♂, 1♀; M.H., 23/6/51, 1♀.

Porphyrops antennata (Carlier) P.P.A., 12/7/52, ♂♂; [Saltings, 15/7/52, ♂]. The few British records of this species show it to be confined to coastal marshes. Verrall refers to it as ' very rare'.

Syntormon pallipes (Fabricius) PH., 13, 15/8/49; D., 13-17/7/52!; [L.B.D., 13-17/7/52!]

Machaerium maritimae Haliday D., 14/7/52; W., 12/7/52; abundant on the clumps of *Spartina* on F.

Argyra argyria (Meigen) W., 19/6/51, 25/6/51.

Campsicnemus curvipes (Fallén) W., 14/7/52, 3♂; 19/7/52; PH., 17/7/52, ♂; [Saltings, 17/7/52, ♂].

C. loripes (Haliday) S.M., 15/7/52.

C. armatus (Zetterstedt) D., 17/6/51, 13/7/52, 17/7/52. A maritime species.

Sympycnus annulipes (Meigen) PH., 19/7/52, ♂♂; W., 14/7/52, ♂, ditch by railway line; [Saltings, 15/7/52, ♂, pond].

Sciopus longulus (Fallén) P.P.A., 12/7/52, ♂. Appears to be mainly a southern species in England.

S. wiedemanni (Fallén) W., 23/6/51.

PHORIDAE

Not collected.

DORILAIDAE

Dorilas semimaculatus (Becker) M.M., 17/6/47 (det. C. A. Cheetham).
Chalarus spurius (Fallén) W., 16/6/51.
Verrallia aucta (Fallén) W., 7/48, 7/52!

SYRPHIDAE

Hover flies and their allies are plentiful at Spurn especially on flowers on the Warren and in the Marsh Meadow. The following list probably includes most of the Spurn species but restricted collecting renders it impossible to give an idea of their local distribution or seasonal abundance.

Paragopsis strigatus (Fallén) D., 17/8/49; W., 25/7/48!; 11/6/50.
[*Eristalinus sepulchralis* (Linnaeus) Lane to Saltings, 17/7/52.]
Tubifera tenax (Linnaeus) 6, 7! M.R., 13/8/49, on *Senecio* flowers.
T. pertinax (Scopoli) 6, 7, and 8, common in all areas.
T. nemorum (Linnaeus) W., 23/7/48; M.R., 13/8/49, on *Senecio* flowers.
Helophilus pendulus (Linnaeus) 6, 7, 8, generally common.
Tropidia scita (Harris) W., 6, 7! A very local species; besides the Humber estuary I have only seen it in Askham Bog, in Yorkshire.
Syritta pipiens (Linnaeus) 6, 7, 8, generally common; M.R., 12/8/49, on *Senecio* flowers.
Rhingia macrocephala (Harris) W., 19/6/51!
Volucella pellucens (Linnaeus) W., 6, 7!
V. bombylans (Linnaeus) W., 6, 7! D., 19/6/47; [Lane to Saltings, 17, 18/7/52.]
Neoascia podagrica (Fabricius) W., 6, 7!
Chilomyia illustrata (Harris) W., 23/7/48.
C. vulpina (Meigen) W., 21/6/47, larva in thistle stem, adult emerged 9/7/47; 20, 25/7/48; 23/6/51, pupa from thistle stem emerged 10/7/51; [Lane to Saltings, 17-18/7/52.]
C. honesta (Rondani) W., 9/6/50, 1♂ as prey of *Empis tessellata*.
[*C. intonsa* (Loew) Lane to Saltings, 17/8/49, 1♂.]
[*Sulcatella metallina* (Fabricius) Lane to Saltings, 17-18/7/52.]
Melanostoma mellinum (Linnaeus) S.M., 16/6/51., var. *dubium* (Zetterstedt) PH., 13/8/49.
Platycheirus manicatus (Meigen) W., 13/8/49, on *Senecio* flowers; 19, 22/6/51.
P. scutatus (Meigen) W., 6, 7, 8! especially on *Senecio* flowers.
P. timeo (Harris) W., 12-14/8/49, on *Senecio* flowers.
P. albimanus (Fabricius) W., 22/6/51.
Paragus tibialis (Fallén) W., 15/8/49, 1♀.
Stenosyrphus compositarum (Verrall) W., 4/6/50, 1♂, 12, 14/7/52, 1♂ 1♀.
Sphaerophoria menthrastri (Linnaeus) W., 14/7/52!; PH., 13/8/49, 9/6/50.
Episyrphus auricollis (Meigen) W., 12/8/49, on *Senecio* flowers.
E. balteatus (Degeer) 6, 7, 8! generally common.
Epistrophe eligans (Harris) S.M., 21/6/47; W., 9, 10, 19/6/51.
Pipiza bimaculata Meigen W., 10/6/50.
Chrysotoxum bicinctum (Linnaeus) W., 6, 7!
Scaeva pyrastri (Linnaeus) W., 6, 7! var. *unicolor* Curtis, 23/7/48, 1♀.
Metasyrphus consisto (Harris) W., 24/7/48, 12/8/49, 22/6/51, on *Senecio* flowers; M.R., 13/8/49, on *Senecio* flowers.
M. luniger (Meigen) W., 25/7/48, 12-14/8/49, on *Senecio* flowers; D., 14/8/49.
Syrphella albostriata (Fallén) Near S.M., 16/6/47; W., 19/6/51.
S. lunulata (Meigen) W., 9/6/50.
Syrphus lucorum (Linnaeus) W., 6, 7!; S.M., 21/6/47.
Syrphidis torvus (Osten Sacken) W., 23/7/48.
S. ribesii (Linnaeus) – W., 6, 7, 8!; S.M., 16, 21/6/47.
S. vitripennis (Meigen) W., 23, 25/7/48.

CONOPIDAE

Physocephala rufipes (Degeer) W., 20/7/48; [Welwick, 18/8/49!]

OTITIDAE

Melieria crassicornis (Fabricius) D., 19/6/47; W., 12/7/52; [Lane to Saltings, 17/7/52.]
[*M. omissa* (Meigen) Saltings, 15/7/52, plentiful on *Phragmites* (K.G.P.)]
M. picta (Meigen) D., 22/7/48, 12/7/52; F., 8/6/50.
Ceroxys urticae (Linnaeus) D., 17/6/47!
Herina lugubris (Meigen) W., 7/52!; PH., 15/8/49.

PALLOPTERIDAE

Palloptera umbellatarum (Fabricius) S.M., 16/6/51!; W., 23/6/51!
P. arcuata (Fabricius) W., 24/6/51, ♀.

TRYPETIDAE

Urophora jaceana (Hering) W., 17/7/48, 14/7/52; [Lane to Saltings, 16, 17/7/52; Saltings, 15/7/52.] Galls the flower heads of *Centaurea nigra* L.
Terellia serratulae (Linnaeus) W., 23/7/48! on spear thistle, 12/7/52; M.R., 13/7/52; [Saltings, 17, 18/7/52!] Known in Yorkshire from Burton Leonard, Ampleforth and various localities in the York area and is probably widespread. It feeds in thistle heads, especially spear thistle.
Trypeta cylindrica (Robineau-Desvoidy) W., 24/7/52.
Xyphosia miliaria (Schrank) W., 20/7/48.
Paroxyna plantaginis (Haliday) W., 23/6/51; D., 14/8/49, 13, 14/7/52; M.M., 16/7/52!; [L.B.D., 16/8/49!; Welwick, 18/8/49!; Saltings, 17, 18/7/52.] Taken by sweeping *Aster tripolium* L., in the flower heads of which the larvae live.
P. parvula (Loew) M.M., 14/8/49, 16/7/52; W., 23/6/51; D., 18/7/52; [Saltings, 17/7/52.] By sweeping *Artemisia maritima* L., the leaves of which are mined by the larvae.
Sphenella marginata (Fallén) W., 31/9/49, 14/7/52; [Saltings, 17/7/52.] Larvae live in the flower heads of *Senecio* spp.
Ensina sonchi (Linnaeus) W., 12/8/49, on *Matricaria* and *Senecio;* M.M., 14/8/49!; PH., 15/8/49!; [Skeffling, 18/8/49; Saltings, 18/7/52.] The larvae occur in the flower heads of many composites.
Trupanea stellata (Fuessly) W., 23/6/51, on *Cirsium vulgare* (Savi) Ten.; [Lane to Saltings, 17/7/52; Saltings, 18/7/52.] The larvae occur on a variety of composites.

LAUXANIIDAE

Calliopum aeneum (Fallén) M.M., 3/6/50; W., 21/6/51.
Minettia fasciata (Fallén) PH., 13/8/49.
M. lupulina (Fabricius) Spurn Point, 6/6/50; S.M., 16/6/51; M.R., 23/6/51.
Sapromyza sordida (Halliday) M.R., 13/8/49, ex *Senecio* flowers; W., 19, 23, 24/6/51.

PSILIDAE

Psila nigricornis Meigen W., 19, 23/6/51.

SEPSIDAE

[*Sepsis punctum* (Fabricius) Saltings, 17/7/52.]
[*S. cynipsea* (Linnaeus) Saltings, 17/7/52.]

SCIOMYZIDAE

Ditaenia cinerella (Fallén) M.H., 13/6/47; W., 16/6/51, 14/7/52.
Tetanocera elata (Fabricius) W., 19/8/49.
T. robusta Loew D., 14/8/49.
Trypetoptera punctulata (Scopoli) M.R., 23/6/51, 14/7/52; W., 14/7/52, swept from occasional sheltered spots; PH., 19/7/52.
[*Pherbina coryleti* (Scopoli) Welwick, 18/8/49; Saltings, 18/7/52.]
Limnia unguicornis (Scopoli) D., 17/6/51; [Dunes near Saltings, 15/7/51; Saltings, 18/7/51.]
Statinia marginata (Fabricius) M.H., 15/6/47; W., 19/6/47, 12, 14/7/52; PH., 17/8/49.
[*Elgiva sundewalli* (Fries) Saltings, 17/7/52, 1♀. The only previous Yorkshire record is by R. H. Meade, York, 1880.]
Salticella fasciata (Meigen) W., 10/6/50, 16, 23/6/51. Said to live in dead land snails in larval stage.

CHAMAEMYIIDAE

Chamaemyia flavipalpis (Haliday) M.H., 13/6/47; PH., 9/6/50; [Lane to Saltings, 17/7/52.]

COELOPIDAE

Not collected.

HELOMYZIDAE

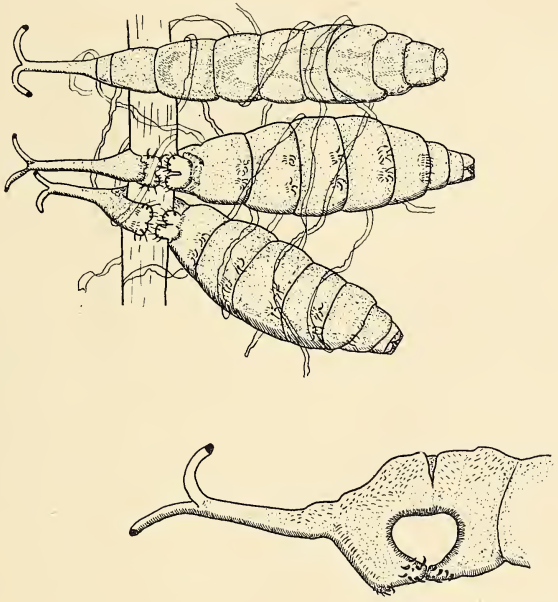
[*Helomyza variegata* Loew Lane to Saltings, 17/7/52, ♂.]

Tephrochlamys ruflventris)Meigen) W., 22/6/51, 14/7/52.

It is worth noting that the maritime *Trixoscelus obscurella* (Fallén) was not seen though swept in abundance in very similar dune vegetation at Dawlish Warren in South Devon in July (K.G.P.).

ANTHOMYZIDAE

Stiphrosoma sabulosum (Haliday) F., 22/6/51; M.R., 23/6/51; a brachypterous species also common in the Marram dunes in 6 and 7.



Drawn by S. Shaw.

FIG. 1. Pupae of *Ephydra riparia* Fallén, attached to strand of *Zannichellia*. Below, enlarged sketch showing caudoventral clasping process.

OPOMYZIDAE

[*Opomyza geminationis* (Linnaeus) Lane to Saltings, 17/7/52.]

Geomyza tripunctata Fallén F., 23/6/51, frequent among Marram roots.

EPHYDRIDAE

Notiophila stagnicola (Robineau-Desvoidy) D., 17/6/51!

N. uliginosa Haliday P.P.A., 23/6/51.

Philygria punctatonervosa (Fallén) M.H., 13/6/47; W., 15/8/49, 5/6/50, 23/5/51!; Saltings, 20/6/51.

Hydropota thoracica (Haliday) W., 7.

Ephydra riparia Fallén The dominant Ephydrid in brackish waters at Spurn. Adults abundant in D., 6, 7, 8, living on surface film. Larvae among *Zannichellia* and *Ruppia*, pupating inside the laval skin. Pupae float on or near surface attached to strands of these plants (fig. 1). The pupae resemble the seed-pods of *Zannichellia* in general shape. This species was incorrectly recorded as *E. micans* Haliday (*The Naturalist*, 1951 140).

Scatella tenuicosta Collin D., 7, 18/6/51.

Parydra quadripunctata (Meigen) S.M., 15/7/52.

SPHAEROCERIDAE
Not collected.

ASTEIDAE
Asteia concinna Meigan M.H., 23/6/51; M.M. and W., 6, 7, rather common.

DROSOPHILIDAE
Not collected.

AGROMYZIDAE
Not collected.
[*Phytomyza ranunculi* var. *flava* Fallén Saltings, 17/7/52, swept. An abundant miner of leaves of *Ranunculus* spp.]

CHLOROPIDAE
Platycephala planifrons (Fabricius) PH., 15/8/49, 19/7/52; W., 20/7/52; Sea cliffs, 13/7/52. Larvae live in stems of *Phragmites*.
Meromyza pratorum Meigen W., 6, 7!; M.H., 15/6/47; D., 17/7/52; PH., 19/7/52; [Saltings, 20/6/51, 15, 17/7/52!]
[*Chlorops* (*Cetema*) *elongata* Meigen Saltings, 15, 17, 18/7/52. A common and widely distributed species.]
C. (*Eutropha*) *fulvifrons* Haliday PH., 19/7/52, two specimens. This species was taken a week later on the dunes at Dawlish, S. Devon. It is known as a sand-dune species and British records are few (K.G.P.).
Thaumatomyia notata Meigen S.M., 15/7/52; [Saltings, 15, 17/7/52!]
Elachiptera cornuta (Fallén) PH., 19/7/52, ♀; [Saltings, 16/7/52, ♀.]

CORDILURIDAE
[*Cnemopogon apicalis* (Wiedemann) L.B.D., 17/7/52, ♀.]
[*Scopeuma stercorarium* (Linnaeus) Lane to Saltings, 17/7/52.]
S. squalidum (Meigen) W., 25/6/51, ♀.
Scatomyza litorea Fallén F., 17/7/48, reared from pupae in seaweed; from one puparium a specimen of the Staphylinid *Aleochara grisea* Kraatz; M.H., 13/6/47.
Norellisoma spinimanum (Fallén) W., 19/6/51, ♂.

LARVAEVORIDAE
Lydella stabulans (Meigen) W., 9/6/50, 19/6/51.
Crocuta geniculata (Degeer) S.M., 13/7/52. A parasite of *Tipula* spp. as well as Lepidoptera.
Eriothrix rufomaculatus (Degeer) W., 13/8/49, on *Senecio* flowers; [Welwick, 18/8/49; Lane to Saltings, 19/7/52.]
[*Dexiosoma caninum* (Fabricius) Lane to Saltings, 17/7/52, a common species known to be a parasite of chafer larvae.]

CALLIPHORIDAE
Sphixapata conica (Fallén) S.M., 18/6/47.
Cynomya mortuorum (Linnaeus) Larvae live in carrion on Humber shore, etc., W., 20/7/48, 9-11/6/50; D., 19/6/47; M.R., 18/8/49, on *Senecio* flowers; [Kilnsea village, 21/6/51.]
Calliphora erythrocephala (Meigen) Larvae in carrion; M.R., 13/8/49, on *Senecio* flowers; W., 13/8/49, on *Senecio* flowers, 16-21/6/51.
Lucilia caesar (Linnaeus) W., 13/8/49, 10/6/50, 19/6/51; M.R., 13/8/49; common on *Senecio* flowers.
L. silvarum (Meigen) W., 22/6/51.
L. sericata (Meigen) F., 8/6/50, in seaweed.
Pollenia rudis (Fabricius) W., 16/7/52.

MUSCIDAE
[*Musca autumnalis* Degeer Lane to Saltings, 17/7/52.]
Graphomya maculata (Scopoli) W., 19/6/51.
Mesembrina meridiana (Linnaeus) W., 10/6/50.
Muscina stabulans (Fallén) W., 19/6/51.
Morellia hortorum (Fallén) W., 14/8/49, 11/6/50, 19-21/6/51.
Stomoxys calcitrans (Linnaeus) W., 14/7/52.
Phaonia perdita (Meigen) W., 16/6/51; D., 19/6/47.
P. erratica (Fallén) W., 17/8/49.
P. incana (Wiedmann) W., 16, 19/6/51.

MUSCIDAE—*continued*

Fannia armata (Meigen) W., 16-19/6/51.
Hebecnema vespertina (Fallén) PH., 14/8/49; W., 19/6/51.
Helina impuncta (Fallén) W., 9-11/6/50, 19, 22/6/51.
H. lucorum (Fallén) W., 22/6/51.
Fucellia fucorum (Fallén) S., 24/6/51, probably plentiful on sands and breakwaters.
F. maritima (Haliday) W., 17/7/48.
Pegomya nigritarsis (Zetterstedt) W., 19/6/51.
Anthomyia pluvialis (Linnaeus) W., 19/6/51.
Dexiopsis lacteipennis (Zetterstedt) W., 16/6/51, 19/6/51.

XIIa. SIPHONAPTERA and ANOPLURA

S. SHAW

During our visits to Spurn a number of fleas were collected and it is thought that a list of them may be a useful addition to the present report. The short account which follows is based on lists kindly sent by Messrs. J. H. Murgatroyd and R. J. Spittle. In addition Dr. P. M. Butler collected a number of fleas from the mammals which he trapped during our visits (see Mammals report).

Spilopsyllus cuniculi (Dale) W., 7/52 (P.M.B.), on Rabbit (*Oryctolagus cuniculus* (Linnaeus)).
Ceratophyllus styx Rothschild Sea cliffs, nest of Sand Martin, 12/7/52 (P.M.B.).
Malaraeus pencilliger (Grube) W., 16/8/49; D., on Long-tailed Field Mouse (*Apodemus sylvaticus* (L.).) (J.H.M.).
Megabothris walkeri (Rothschild) M.M., both sexes in nest of Bank Vole (*Cleithronomys glareolus* Schreber) (P.M.B.).
Ctenophthalmus agyrtes sub-species *nobilis* Rothschild D., 17/8/49; W., on *A. sylvaticus* 16, 21/8/49, 7/52 (J.H.M., P.M.B.); W., nest of *C. glareolus* 2♂♂, 2♀♀, 6/50 (R.J.S.); M.H., nest of *C. glareolus*, 7/52 (P.M.B.).
Palaeopsylla sorecis (Dale) D., 1♂, in shrew (?) runs on grassy bank, 4/5/50 (R.J.S.); PH., on shrew (*Sorex areneus* L.), ♀♀, 7/52 (P.M.B.); Boundary Dyke, on Water Shrew (*Neomys fodiens* Schreber), both sexes, 7/52 (P.M.B.).
Leptopsylla spectabilis (Rothschild) PH., on *C. glareolus*, 7/52 (P.M.B.).
Hystrichopsylla talpae (Curtis) W., amongst grass, 16/8/49 (J.H.M.), in nest of *C. glareolus*, 4♀♀, 6/50 (R.J.S.); D., in nest of *A. sylvestris*, 17/8/49 (J.H.M.); M.H., in nest of *C. glareolus*, 8/6/50 (S.S.); Spurn Point, 19/8/49, in marram (P.M.B.).

Records of two species of Bird Lice have been kindly supplied by Mr. J. H. Murgatroyd.

Austromenopon strepsilae (Denny) Spurn Point, 21/8/48, on Turnstone (P.M.B.).
Degeeriella strepsilaris (Denny) Spurn Point, 21/8/49, on Turnstone (P.M.B.).

XIII. ARACHNIDA

A. C. BRAHAM AND J. H. MURGATROYD

The relationship between spiders and their environment covers a very wide field which is controlled primarily by climate and vegetation and in the case of certain ground species by the nature of the soil. Climatic conditions embrace temperatures from arctic to tropical, humidities from arid deserts to tropical rain forests, still air or high winds, brilliant sunshine to dark caves and atmospheric densities from deep valleys to mountain tops.

Vegetation is no less important in the ecology of spiders, certain plants appear to attract spiders by virtue of their suitability to provide the type of shelter and protection required, the strength and rigidity of the stems and branches to which their webs can be attached, the density of the foliage giving shelter from wind and rain, and perhaps of even greater importance an ample supply of food provided by the abundance and type of insect life associated therewith, together with the essential humidity furnished by the type of vegetation chosen.

Other types of vegetation seem to be distasteful to most spiders due either to their pungent odour which is no doubt discernable by the chemotactic sense they

possess or by reason of an unpleasant texture of the stems and leaves caused by exudations of oils, or resins.

Various types of soil also appear to be preferred by certain ground-dwelling species, thus soils containing sand, chalk, clay or loam each have their adherents and it is probable that in addition to the density or porosity of the soils, their moisture retaining or draining properties have an important bearing upon the types of spiders which live upon or build their nests in them.

This research was carried out in conjunction with an investigation into the insect ecology of the Spurn Peninsula during the four annual visits mentioned in the introduction and supplemented by two extra visits made by Murgatroyd in July, 1948 and August, 1949.

The district was divided into eight main areas each of which was systematically worked, and the results of the survey are given in a table divided into these eight areas to which is added a general list of habitats under each area.

In a small district so localised as Spurn Peninsula, extreme variations in environment are not to be found and thus many specimens of the same species were taken in different areas, but generally in similar habitats, which is to be expected.

A letter has been given to each area and against these letters appear certain numbers which represent the year in which specimens of each species were taken.

In addition an indication of their abundance or rarity is shown by another letter in brackets and keyed to the following table.

A=Abundant. C=Common.
U=Uncommon. R=Rare.
V=Very rare.

To make the report more comprehensive and to ensure that reference may readily be made to any species in the list the authority for the nomenclature is given separately for each order.

ECOLOGICAL AREAS AND HABITATS

Area A—*Kilnsea Warren.*

Amongst the roots of Marram grass, under stones, around cottage and hutments, on Phragmites patch, amidst meadow grass and low vegetation and in and around cottage in nooks and crannies.

Area B—*Humber Foreshore.*

On sand and shingle, amongst seaweed, under derelict and rotting timbers, amongst tidal and shore debris and under stones.

Area C—*Walker Butts Bank Dyke.*

Amongst the roots of Marram grass, amidst meadow grass and low vegetation, amongst water reeds and on slime and mud.

Area D—*Marsh Meadow.*

Amongst meadow grass, on wild plants and low vegetation, on bushes and hedges and in and around hutments.

Area E—*North Sea Foreshore.*

On sand and shingle, amongst seaweed, under stones and rocks, amongst tidal debris and roots of Marram grass.

Area F—*Salt Marsh.*

Amongst the roots of Marram grass and other plants, on the sandy foreshore amongst seaweed and debris, amongst low scrub and under stones and rocks.

Area G—*Main Ridge.*

Amongst Sea Buckthorn, Phragmites ,Marram grass, Sea holly, and low vegetation on trees and shrubs and dense bush.

Area H—*Shingle and New Dunes.*

On sand and shingle, amongst seaweed and tidal debris, under stones and amongst the roots of Marram grass.

ARANEAE

Arrangement and Nomenclature according to Bristowe (1939-41) with certain corrections.

DICTYNIDAE

Ciniflo ferox Walck. (R) A1.
C. similis Bl. (A) A23-C2.
C. fenestralis Stroem. (C) A12.

DYSDERIDAE

Dysdera crocata C.L.K. (C) A234-D4.

DRASSIDAE
Drassodes lapidosus Walck. (U) A234-B1-C2-D4-E1-F34-G4-H23.
D. lapidosus var. *cupreus* Bl. (R) A4.
D. pubescens Thor. (R) A3.
Scotophaeus blackwalli Thor. (U) A2.
Zelotes latreillei Sim. (R) D3.
Z. electus C.L.K. (U) A4-B12-E1-F123-H23.
Micaria pulicaria Sund. (U) A34-C3-D4.

CLUBIONIDAE
Clubiona terrestris Westr. (R) A124-B14-F2.
C. stagnatilis Kulcz. (R) A24.
C. neglecta Camb. (R) A34.
C. phragmitis C.L.K. (C) A23-B1-E1-F2-H2.
C. pallidula Clerck. (A) A1234-B1-D34-F2-G2.
C. diversa Camb. (R) D4.
C. reclusa Camb. (U) A24-B14.
C. lutescens Westr. (C) A23-B1-C2-F2.
C. trivialis C.L.K. (C) A23-B3-C2-F2.
C. subtilis L.K. (R) A1-B1-E1-F2-H2.
C. compta C.L.K. (R) A4.
Phrurolithus festivus C.L.K. (R) A2.

THOMISIDAE
Xysticus cristatus Clerck. (A) A1234-B14-C234-D124-E34-F124-G14-H14.
Oxyptila atomaria Panz. (U) A2-E2-G2.
Philodromus aureolus Clerck. (C) A24-C24-G23.
Tibellus oblongus Walck. (A) A124-B1-C34-D123-E34-G124-H2.
T. maritimus Menge. (U) A3-C2.

SALTICIDAE
Heliophanus flavipes C.L.K. (U) A13-C12-F1.
Hyctia nivoyi Luc. (A) A123-B1-C23-E1-F13-G4-H1.
Euophrys frontalis Walck. (C) A123-B1-C4-E3-F1-H12.
Evarcha falcata Clerck. (U) A1-F1-G1-H1.

LYCOSIDAE
Lycosa amentata Clerck. (U) A14-C24-G14.
L. agricola Thor. (U) F1-G1.
L. pullata Clerck. (A) A234-B1-C24-E34-F14-G4.
L. tarsalis Thor. (R) C4.
Tarentula pulverulenta Clerck. (U) A1-C1-D1-G1.
Xerolycosa miniata C.L.K. (U) A34.
Trochosa ruricola Degeer (U) A1-B1-D1-G1.
T. terricola Thor. (C) A13-B1-E13-F1-G1-H1.
Arctosa perita Latr. (C) A123-B13-C24-D4-E1-F1-G14-H1.
Pirata hygrophilus Thor. (R) A3.
P. piraticus Clerck. (C) A123-B1-C1-D1-E1-F1-H1.

AGELENIDAE
Tegenaria domestica Linn. (C) A134-F3

TETRAGNATHIDAE
Tetragnatha extensa Linn. (A) A24-C1234-D14-G4.
Pachygnatha degeeri Sund. (U) A3.
P. clercki Sund. (C) A3.

ARGYOPIDAE
Meta segmentata Clerck. (A) A13-C1-D124-E1-G13.
Araneus diadematus Clerck. (C) A123-C123-D1-E1-F1-G13.
A. quadratus Clerck. (A) A3-C13-D14-E3-G4.
A. cornutus Clerck. (R) A2-C4-D14.
Zygiella x-notata Clerck. (C) A3-C3-D1-E1-G1-H1-

THERIDIIDAE
Theridion tinctum Walck. (R) A3.
T. bimaculatum Linn. (C) A14-C124-D14-G14.
T. lineata Clerck. (C) A123-C123-D1-E1-G14.

Pholcomma gibbum Westr. (R) A4.
Stearodea bipunctata Linn. (A) A1234-C2.
Robertus lividus Bl. (R) C2-D4.

MIMETIDAE
Ero furcata Vill. (R) A1-C2-D4-E1-G1.

LINYPHIIDAE
Trichopterna thorelli Westr. (R) G4.
Pocadicnemis pumila Bl. (U) A2-C24-F4.
Diplocephalus cristatus Bl. (R) A3.
Cornicularia cuspidata Bl. (R) G4.
C. unicornis Camb. (R) H3.
C. vigilax Bl. (R) A3-E1-G1.
Gonatium rubens Bl. (U) A14-E1-G1
Hypomma bituberculata Wid. (U) A4-C4-D4-
Dismodicus bifrons Bl. (U) A4-C3-D4.
Gongylidium rufipes Linn. (U) A4-C4-
Erigone dentipalpis Wid. (C) A13-C123-D1-E1-F1-G1.
E. atra Bl. (R) C2.
Oedothorax fuscus Bl. (C) A134-C14-D14-G14.
O. retusus Westr. (R) A3.
Tmeticus affinis Bl. (U) A1.
Ostearius melanopygius Camb. (R) A4.
Maso sundevalli Westr. (U) A12.
Porrhomma microphthalmum Camb. (R) H4.
P. proserpina Sim. (U) C4-D4.
Bathyphantes nigrinus Westr. (U) E3.
B. concolor Wid. (U) A3.
B. gracilis Bl. (R) E3.
Poeciloneta globosa Wid. (R) G4.
Linyphia montana Clerck. (U) A34.
L. triangularis Clerck. (U) A4.
Stemonyphantes lineata Linn. (C) A1-C1-D1-F1-G1.
Tapinopa longidens Wid. (R) A3-F1-G1-
Lepthyphantes minutus Bl. (C) A2-G1.
L. nebulosus Sund. (C) A1-B2.
L. obscurus Bl. (C) A13-D4.
L. pallidus Camb. (C) C3.
L. tenuis Bl. (C) A3-C3-G1.
L. flavipes Bl. (U) A1.
L. tenebricola Wid. (U) A3.
Meioneta impavida Hull. (R) A3.

OPILIONES
Nomenclature according to Savory (1944)

NEMASTOMATIDAE
Nemastoma lugubre Müller. (U) B3-C2.

PHALANGIIDAE
Lacinius ephippiatus C.L.K. (R) A23.
Liobunum rotundum Latr. (C) A3-C3.
Mitopus morio Fabr. (C) A23.
Phalangium opilio Linn. (A) A123-C23-E3.
Platybunus triangularis Herbst. (R) A4.

CHELONETHI
Nomenclature according to Chamberlin (1931).

CHTHONIIDAE
Chthonius orthodactylus Leach. (U) H4.

CHELIFERIDAE
Dactylochelifer latreilei Leach. (C) A1234-B1234-C34-D3.

ACARI
Nomenclature according to Vitzthum (1929).

PARASITIDAE
Pergamasus crassipes Linn. A2.
Macrocheles oudemansi Hull. F3.
Poecilochirus necrophori Vitz. H3.

HAEMOGAMASIDAE
Haemogamasus oudemansi Hirst. A4.
H. nidi Mich. A3.

LAELAPTIDAE
Eulaelaps pachypus Herm. A3.

DERMANYSSIDAE
Dermanyssus gallinae Degeer A3.

IXODIDAE
Ixodes reduvius L. A4.
*I. triangulicep*s Birula. G4.

TROMBIDIIDAE
Trombidium holosericeum Linn. A4.
T. scharlatinum Berl. G4-H4.

ERYTHRAEIDAE
Erythraeus pachypus Hull. A3-H3.
E. regalis C.L.K. A2-C2-F3.
E. phalangioides Degeer E3.
Ritteria nemorum L. Koch. B4-E4.

DEDUCTIONS

Only a few ecological inferences can be drawn from the preceding tables due to the limited area and isolated nature of this narrow strip of country where extremes of temperature, moisture, vegetation and altitude vary so little from year to year.

An examination of the tables does reveal however, that the greatest number of spiders were taken in the Kilnsea Warren area, which is the 'populated' area containing Warren Cottage and formerly a large number of hutments and out-buildings all fairly close together. In addition this area is the largest, the most varied and the most protected area on the peninsula which would account for the fact that seventy-eight species of spiders were found in this area out of a total of ninety-four species taken.

The complete analysis being as follows:

A	79 species	E	24 species
B	19 ,,	F	24 ,,
C	40 ,,	G	35 ,,
D	29 ,,	H	14 ,,

Generally most species were found in the area and habitat in which one would expect to find them.

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Note: The latest list prior to this is W. Falconer's list of the spiders of Hull and District, 1924, his areas however are too wide and vague to make any satisfactory comparison with the present list.

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XIV. OTHER INVERTEBRATES AND VERTEBRATES, excluding BIRDS

P. M. BUTLER

EARTHWORMS (Lumbricidae)

Dependent as they are on the presence of humus, earthworms are restricted in distribution in the area covered by the Spurn survey. They were found predominantly on the clay area of the Warren and in the formerly cultivated area immediately round the Cottage. No collecting was done in the Marsh Meadow except at the edges of the ponds, but it is probable that the earthworms fauna resembles that of the Warren. *Dendrobaena subrubicunda* was common under boards lying on sandy soil near the Cottage, and an immature specimen of *Dendrobaena*, perhaps this species, was found in a thin layer of soil formed on the sand under *Hippophae* on the main ridge. On the main ridge near the Warren, where the soil was about two inches deep, a dense population of *Lumbricus castaneus* was found.

The weather was dry during my visits to Spurn in 1949 and 1950, and earthworms were difficult to find; most of the collecting was done in 1951 and 1952, when there was more rain. In 1953 the earthworm population was found to be very adversely affected by the floods of the previous winter, which apparently exterminated most of the earthworms of the Warren except in a very limited area near the Cottage, and only five species were found.

For the identifications Cernosvitov and Evans (1947) (Linnean Society Synopses of the British Fauna, No. 6, Lumbricidae) was used. Twelve species were found, as follows:

Allolobophora calignosa (Sav.), under stones near cottage, 51, few; in horse dung, warren, 51, few; damp soil, warren, 51, few; [heap of rotting straw in field near warren, 51, common].

A. chlorotica (Sav.), near cottage, in ground formerly cultivated and under trees, 49, 50, 51, 52, 53, numerous; horse dung and damp soil, warren, 51, few; [heap of rotting straw in field near warren, 51, common].

A. terrestris var. *longa* (Ude), near cottage, in ground formerly cultivated, 49, 51, 53, few.

Bimastus eiseni (Levinsen), 2 specimens, damp soil, warren, 51.

Dendrobaena mammalis (Sav.), 2 specimens, Phragmites area, 52.

D. subrubicunda (Eisen), under boards, sandy areas near cottage, 49, 51, common; under trees near cottage, 51, few; damp clay soil, warren, 51, few.

Eisenia rosea (Sav.), under stones near cottage, 51, few.

Eiseniella tetraedra (Sav.), edge of bomb crater, warren, 49, 50, 51, common; edge of pond in Marsh Meadow and pond near Boundary Dyke, 49, 50, common; damp clay soil, warren, 52, common; horse dung, warren, 51, common. This species was not found in 53, and appears to have been exterminated.

Lumbricus castaneus (Sav.), under stones on sandy soil near cottage, 51, common; in ground formerly cultivated and under trees near cottage, 51, 53, few; damp soil and horse dung, warren, 51, few; [straw heap in field near warren, 51, common] soil under *Hippophae* on main ridge near warren, 53, numerous.

[*L. rubellus* (Hoffm.), straw heap in field near warren, 51, few.]

L. terrestris (Linn.), under stones and in soil formerly cultivated near cottage, 51, few; probable immature specimens found here, 53.

Octolasium cyaneum (Oerley), one specimen near bomb crater, warren, 49.

MOLLUSCA

The area surveyed at Spurn includes marine, freshwater and terrestrial habitats, together with transitional conditions in salt marshes and brackish water, and this variety is reflected in the molluscan fauna. During my visits to Spurn the time I have been able to devote to the collection of molluscs has been limited, and no doubt the list could be expanded, particularly as regards the marine species. The flooding in January, 1953, no doubt had a serious effect on some of the species, especially those confined to the Warren, but time did not permit anything more than a cursory investigation of the results of the flooding, except for the aquatic species. Very considerable assistance with the identifications was given by Dr. J. W. Jackson.

AMPHINEURA

Lepidochitona cinereus (L.). Common on lumps of chalk on the Humber shore near the Marsh Meadow, 52.

(*To be continued*)

YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1953

GRINTON, V.C. 65, May 22nd—25th

The Coronation holiday may have been the cause of the limited numbers of members attending this meeting, but those present at the official meeting responded to the roll-call for fifteen Societies.

On Saturday, Miss Rob, who had made the arrangements, led the party into the strong wind on Fremington Edge and here members were rewarded with a fine show of the two plants of the lead-mine refuse, Spring Sandwort and Alpine Penny Cress, and these with the Mountain Pansy were also plentiful at the old lead-mining village of Hurst where the Moonwort fern grew freely. By the roadside near Hagg Cottage in one corner the Wood Forget-me-not flowered so freely that at first sight it was taken for a field of Bluebells.

The next outing was to see the extensive Juniper area at Harkerside. The plant seemed very healthy and people in the locality were sure that the plants were increasing though no young ones were noted. A few of the bushes showed the swollen stems and the yellow fungoid growths of *Gymnosporangium clavariaeforme*. Under the Juniper and the associated Heather and Bilberry tufts a moss, *Orthodontium gracile* Wils. was found in plenty. Burrell, in *The Naturalist*, 1940, p. 302, only gives V.C. 64 for this. The last walk up the Arkle was brought to a quick end by the thunderstorm which sent all back hurriedly. At the meeting reports were given and Miss Rob was warmly thanked for all the trouble she had taken in making the arrangements for the excursion.

Flowering Plants (W. A. Sledge): On Saturday's excursion to Hurst via Fremington Edge the limestone scars were first examined without yielding any plants of particular interest. On the plateau leading over to Hurst and about Hurst itself the spoil heaps of the old lead mines were everywhere colonised by *Thlaspi alpestre* L. and *Minuartia verna* (L.) Hiern. The Mountain Pansy (*Viola lutea* Huds.) was also abundant hereabouts and both Moonwort and Adder's Tongue fern were seen. Between Hurst and Marrick, Mossy Saxifrage and Frog Orchis were noted, the former in some quantity, and the woods at Marrick yielded *Geranium sylvaticum* L., *Myosotis sylvatica* Ehrh., *Lathraea squamaria* L., and *Veronica montana* L. The riverside between here and Grinton is fringed by willows which included in addition to *Salix pentandra* L., *S. purpurea* L., *S. atrocinerea* Brot. and *S. phylicifolia* L., some indeterminate shrubs of presumed hybrid origin. *Equisetum hyemale* L., *Botrychium*, *Cardamine amara* L. and *Stellaria nemorum* L. were also seen by the river close to Grinton Bridge.

On Sunday while the main party examined the Juniper area, I worked along the whole length of Fremington Edge in an unsuccessful attempt to verify Baker's record of *Hornungia petraea* (L.) Rchb.; nor were *Draba incana* L. or *Thalictrum montanum* seen. These south-facing scars are very dry and they yielded no uncommon plants. Descending into the gill above Booze, *Thlaspi alpestre* L. and *Minuartia verna* (L.) Hiern were again conspicuous on lead mine workings and during the return along the Arkle Beck *Cardamine amara* L. and *Stellaria nemorum* L. were found.

The main party when searching the Juniper area above Grinton collected an *Empetrum* with hermaphrodite flowers, but a subsequent re-examination on the spot showed no other correlated differences between hermaphrodite and unisexual plants and the specimens seem best referred to hermaphrodite *E. nigrum* L. After leaving the Juniper area, *Equisetum hyemale* L. and *Ribes alpinum* L. were seen in Barney Gill.

The walk up the Arkle Beck on Monday yielded few additional plants other than Globe flower (*Trollius europaeus* L.) but an early return was necessitated owing to an approaching thunderstorm. Mr. Shaw gathered Herb Paris and *Carex paniculata* L. near Reeth.

Mosses (G. A. Shaw): The list of Mosses seen on the Reeth excursion is rather poor, and it must be admitted that in the absence of our Recorder collecting was not as intensive as it might have been. The following were definitely identified:

Fremington Edge

Polytrichum aloides Hedw. c. fr.
Fissidens adiantoides Hedw.
Dicranoweissia cirrata (Hedw.) Lindb. c. fr.

FREMINGTON EDGE—*continued*

Encalypta streptocarpa Hedw.
Tortula subulata Hedw. c. fr.
Trichostomum crispulum Bruch.
Weissia controversa Hedw. c. fr.
Bryum pallens (Brid.) Rohl.
Bryum capillare Hedw.
Orthotrichum cupulatum Brid. c. fr.
Neckera crispa Hedw. var. *falcata* Boul.
Cratoneuron filicinum (Hedw.) Roth.

HARKERSIDE

Pleuridium acuminatum Lindb. c. fr.
Ceratodon purpureus (Hedw.) Brid, c. fr.
Dicranella heteromalla (Hedw.) Schp. c. fr.
Tortula subulata Hedw. c. fr.
Barbula fallax Hedw.
Rhacomitrium canescens (Hedw.) Brid.
Pohlia albicans (Wahl.) Lindb.
Bryum pseudotriquetrum (Hedw.) Schwaegr.
Bartramia pomiformis Hedw. c. fr.
Philonotis fontana (Hedw.) Brid. c. fr.
Eurhynchium striatum (Hedw.) Schp.

ARKLE BECK

Dichodontium pellucidum (Hedw.) Schp.
Barbula fallax Hedw.
Grimmia apocarpa Hedw. c. fr.
G. pulvinata (Hedw.) Sm. c. fr.
Orthotrichum cupulatum Brid. c. fr.
Neckera complanata (Hedw.) Huben.
Thuidium tamariscinum (Hedw.) B. & S. (also by Barney Beck).
Cratoneuron commutatum (Hedw.) Roth· c. fr.
Drepanocladus fluitans (Hedw.) Warnst.
Hygrohypnum luridum (Hedw.) Jennings
Eurhynchium striatum (Hedw.) Schp.
Hypnum cupressiforme Hedw.
Ctenidium molluscum (Hedw.) Mitt.
Preissia quadrata (Scop.) Nees (fertile).

Ornithology (R. Chislett): Situated where Swaledale widens to receive the Arkle Beck, with high moors above on all sides, several wooded gills, and daleside woodlands down to river level in places, and with some cultivated land, the Reeth neighbourhood could be expected to provide a good list of birds. The total of 63 species identified would have been little behind the 1952 figure for the Loftus area but for the absence of the sea birds.

Summer Lodge Tarn was visited and the Black-headed Gulls estimated at not less than 500-600 pairs. The area around the tarn also yielded nests with eggs of Curlew and Golden Plover, and the behaviour of a pair of Short-eared Owls, one of which gave the below-breast wing-clapping display, seemed indicative of the presence of eggs or young somewhere.

Ring-Ousels had nested early for young were seen on somewhat uncertain wings. A Merlin flew along a moor-edge below which were white-splashed rocks. All the moorland birds except the Twite were noted. Below the moors, about an extensive tract of Juniper, were Linnets and Whinchats.

Visits to several riverside woods produced Pied Flycatchers, Redstarts and Wood-Warblers in each. In one wood a Carrion Crow brooded whilst we lunched and searched below.

Other species included in the list were Rook, Jackdaw, and Magpie; Greenfinch, Chaffinch, and Lesser Redpoll; Yellow Bunting and Skylark; Tree and Meadow Pipits; Yellow, Grey and Pied Wagtails; Creeper, and Blue, Great, Coal, and Marsh Tits; Spotted Flycatcher; Willow, Sedge, and Garden Warblers; and Blackcap, Whitethroat, and Lesser Whitethroat; Wheatear; Dipper and Wren; the three *Hirundines*, and the Swift; Dunlin, Sandpiper, Redshank, Snipe, Moorhen, Grouse, Pheasant and Common Partridge. A Corncrake was heard repeatedly by the botanists but remained silent whenever W. K. Mattinson and I approached the area. Turdidae were unexceptionally plentiful excepting the Mistle-Thrush which was scarce. Two ducks seen at a distance were probably Mallard.

Mammals. Only the Rabbit (90 in one field), Weasel, and Hedgehog were noted.

Lizards were seen on high moorlands and near to the river.

A heavy thunderstorm gave an opportunity to note the rapid rise and fall, in a few hours, of the becks and river, prior to which naturalists of all sections converged hastily upon headquarters.

Entomology (C. A. Cheetham): Time was mostly devoted to the insects generally worked by freshwater biologists. Diptera are not usually associated with water but *Hexatoma* (*Peronocera*) *fuscipennis* Curtis, one of the Craneflies which occurs on river shingle beds was seen in plenty. This has not often been recorded in Yorkshire. A single male of the other species, *H. bicolor* Mg. (*Peronocera lucidipennis*) was also caught. Another species, *Atherix ibis* F. was taken. This has the curious habit of making a cluster of dead ones overhanging the stream as shown in *Cambridge Natural History*, **6,** 480. *Dioctria rufipes* Deg. another river-side dweller was also plentiful. Other diptera here included the Craneflies *Tipula vittata* Mg., *T. lateralis* Mg., *T. variipennis* Mg., *T. vernalis* Mg., *Ephelia marmorata* Mg. and *Bibio marci* L. and *B. nigriventris* Hal.

Owing to the strong wind, Mayflies were scarce, those taken being *Ecdyonurus torrentis* Kimmens., *Rithrogena semicolorata* Curtis., and *Centroptilum luteolum* Müll. Stoneflies were more plentiful the two Yellow Sallys, *Isoperla grammatica* Poda. and *Chloroperla torrentium* were abundant and so was the small black *Nemurella inconspicua* Pictet. It was interesting to watch a large female *Perla cephalotes* Curtis. creep down the stones on the stream side and then float out on the swift-flowing water to deposit eggs.

Further from the river and at the head of Arkle Beck near Tan Hill, *Tipula subnodicornis* Zett. (*plumbea*) was plentiful though cotton grass with which this is usually associated was rather scarce.

Conchology (E. M. Morehouse): The following molluscs were observed:

Arion ater v. *aterrima* Taylor.
Agriolimax agrestis L.
Limax maximus L.
Milax sowerbyi Fer.
Vitrea alliaria Mill. (abundant).
V. cellaria Mull.
Vitrea crystallina Mull.
Pyramidula rotundata Drap.
Hygromia hispida L.
Clausilia bidentata Strom.
C. laminata Montagu.
Lauria cylindracea Da Costa.

Several of these species together with the following were later observed at Askrigg:

Arion ater v. *brunnea* Roebuck.
Vitrea pura Alder.
Hygromia rufescens Pen.
Euconulus fulvus Mull.
Arianta arbustorum L.
Helix hortensis Mull.
Cochlicopa lubrica Mull.

COLLINGHAM, V.C. 64, June 13th

Despite the unsettled weather, this meeting was well attended though few specialists were present. Thanks are due to Mr. J. W. Catlow of Wood Hall and E. Gillings whose farmland adjoins the Wood Hall Estate, for their kind permission to visit their estates.

The meeting for presentation of reports on the excursion was not so well attended largely due to the failure of many to order their tea in advance as instructed. Our New Divisional Secretary for Vice County 64, H. M. Russell, had worked hard to arrange this his first meeting and he was thanked by the members present.

Flowering Plants (F. W. Adams): After leaving Collingham, the flora of Linton Common was investigated. *Brachypodium pinnatum* (L.) Beauv., and *Zerna erecta* (Huds.) Panz. were abundant together with *Lolium multiflorum* Lam. near the building sites. *Asperula cynanchica* L. was frequent. Other species present included *Hypericum montanum* L., *Astragalus danicus* Retz., *Genista tinctoria* L. and *Rhinanthus minor* Ehrh. Close to the Common, by a farm, luxuriant specimens of *Geranium pyrenaicum* Burm. f. and *Erodium cicutarium* L. were seen. *Hesperis matronalis* L. was common along the banks of the river with *Conium maculatum* L., *Barbarea vulgaris* R. Br., *Geranium pratense* L., *Rorippa islandica* (Oeder) Borbás, *Ribes sylvestre* (Lam.) Mert. et Koch., and *Aconitum sp.*, which was naturalised.

Near Woodhall Bridge *Stellaria nemorum* L. was found in small quantity. The adjacent woodlands yielded *Viola hirta* L., *Myosotis sylvatica* Ehrh., *Veronica montana* L., *Campanula latifolia* L., *Centaurium minus* Moench, *Hordelymus europaeus* (L.) Harz., and *Roegneria canina* (L.) Nevski. Above the wood the more open ground

provided *Helictotrichon pratense* (L.) Pilger, *H. pubescens* (Huds.) Pilger, *Trisetum flavescens* (L.) Beauv. and *Bromus lepidus* Holmberg.

Helleborus viridis L. ssp. *occidentalis* (Reuter) Clapham, *Origanum vulgare* L., *Polygala vulgaris* L., *Orchis fuchsii* Druce and *Listera ovata* (L.) R. Br. were seen in Langwith Scrub.

Ornithology (R. Chislett): Individual activities seldom allow time for ornithologists to attend meetings in mid-June and few were present. The wooded areas along both sides of the Wharfe, and on the hills beyond the north bank yielded many species. Nests with young of Chiffchaff and Great Spotted Woodpecker turned up. Warblers included one pair of Lesser Whitethroats, Willow-Warblers, Blackcaps, Garden-Warblers, and Common Whitethroats were fairly numerous. Two pairs of Redstarts and a Kingfisher were noted, and a Little Owl. The Bullfinch and the Tree-Pipit seemed to be scarce. In general, the 48 species noted included most of those mentioned by Mr. Dewar in the Circular, and no doubt further search would have revealed the few others that were not seen. Linton Common was under cultivation, and some parts of the area are losing attractions as the result of building operations.

Coleoptera (J. H. Flint): Wet conditions made collecting difficult, and few species were taken. *Macroplea appendiculata* Panz., *Agabus didymus* Ol. and *Orectochilus villosus* Mull. were taken, as expected, at Woodhall Bridge, but nothing else of note was seen.

During a preliminary survey of the area on 25/5/53, H. M. Russell took a single specimen of the rare *Saprinus virescens* Payk. near Woodhall Bridge. *Ochina ptinoides* Marsham has been bred out of old ivy stems taken from the same locality.

Odonata (J. H. Flint): The dragonfly *Agrion splendens* Harris was found by several members at Woodhall Bridge. *Agrion* has been reported before from here, but this is the first authenticated record. *Ischnura elegans* Van der Lind. and *Coenagrion puellum* L. were also present along the river bank.

Diptera (H. M. Russell): Very few flies were seen. The only interesting specimen taken was *Atherix ibis* Fab. from the river bank in Ox Close.

Conchology (E. M. Morehouse): There were quite a number of molluscs found at Collingham, but *Pomatia elegans* Müll., found by the writer three years ago; was not observed.

Arion ater L.
A. ater v. *aterrima* Taylor
A. ater v. *brunnea* Roebuck
A. hortensis Fér.
Limax maximus L.
Agriolimax agrestis L.
Vitrea cellaria Müll.
V. alliaria Mill. (plentiful).
V. pura Alder
V. rogersi Woodward
Ena obscura Müll.
Cochlicopa lubrica Müll.
Clausilia bidentata Ström.
C. laminata Montagu
Pyramidula rotundata Drap.
Hygromia rufescens Pen.
Helix aspersa Müll.
H. hortensis Müll.
Theba cantiana Montagu
Lauria cylindracea Da Costa
Carychium minimum Müll.
Vitrina pellucida Drap.
Neritina fluviatilis Montfort
Ancylus fluviatilis Müll.
Limnaea peregra Müll.
L. peregra v. *ovata* Drap.

HELMSLEY, V.C. 62, June 27th

Although the meeting was held in the evening at Helmsley, the field excursion might better be said to have been at Rievaulx and Ashberry Hill where botanists and entomologists spent the greater part of the time. We were fortunate in having the help and local knowledge of Adam Gordon at our disposal and our best thanks are due to him for the time and trouble he gave on our behalf.

Ornithology (J. P. Utley): For the beauty of contiguous surroundings the route followed on this excursion will be hard to beat; the occasional mid-distance glimpses of the Rye Valley which were granted, and the tranquility of the Rievaulx setting were parts in the formation of a very harmonious whole. There is a feeling of permanence, almost of immortality, in this valley: I do not think there has been much change in the outlook since the days when Walter de l'Espec looked over the

scene from under the graceful arches of his Abbey and pondered on the wonders of creation. Nature is effectively screening from view the remains of the big war-time Military Camp and in this man is assisting by planting the base areas of the butments and environments with Scots Pine.

That this area is extremely rich in bird life was evinced by the records made which at the best could only be classed as taken *en passant*. Thoroughly to determine the strength and nature of the bird life here will need much more than a stroll, however beautiful and worth taking that may be. The recording of 55 species without extensive search is a pointer to what could be expected.

Mr. Adam Gordon, Head Gamekeeper of the Feversham Estate, who conducted the tour, is a man with a sound knowledge of the natural history of his country; he mentioned certain species such as Pied Flycatcher, some Owls and Quail which were not recorded though are certainly known in the area visited. He spoke of the Nuthatch as one of the ' show ' birds of Duncombe Park, yet it was seldom seen, much to the disappointment of some members of the party.

An effort was made by Mr. Chislett, Mr. Garnet and myself to establish the records of Corncrake and Black Redstart but in the case of the former the lateness in the season of the visit and of the latter, the number of people present in the neighbourhood, were possibly the causes why no contact was made.

Here is a list of species actually noted: Carrion Crow, Rook, Jackdaw, Magpie, Starling, Greenfinch, Goldfinch, Lesser Redpoll, Linnet, Chaffinch, Yellow Bunting, House-Sparrow, Tree-Sparrow, Skylark, Tree Pipit, Grey Wagtail, Pied Wagtail, Tree-Creeper, Nuthatch, Great-Tit, Blue-Tit, Coal-Tit, Spotted Flycatcher, Chiffchaff, Willow-Warbler, Wood-Warbler, Sedge-Warbler, Garden-Warbler, Blackcap, Whitethroat, Mistle-Thrush, Song-Thrush, Blackbird, Robin, Hedge-Sparrow, Wren, Dipper, Swallow, House-Martin, Sand-Martin, Swift, Kingfisher, Green Woodpecker, Great Spotted Woodpecker, Cuckoo, Kestrel, Wood-Pigeon, Stock-Dove, Turtle Dove, Curlew, Lapwing, Moorhen, Pheasant and Partridge. Witherby's order has been followed as this is the one in most general use.

Freshwater Biology (H. Whitehead): Thanks to the Rev. T. B. Kitchen and his car, Mr. Cheetham and I were able to visit four stations. Two of these were on streams near Ashberry Hill and the others were on the River Rye, one half a mile south of Rievaulx and the other below Helmsley. The beds of the streams were covered with bare angular stones and there was very little plant growth. In this region the Freshwater Shrimp (*Gammarus pulex* L.) was common and considerable numbers of *Agapetus* larvae covered the larger stones. The river near Rievaulx had a bed composed of large stones but there was very little evidence of a microflora and mosses were few and of poor growth. The following species were taken. Alderfly, *Sialis fuliginosa* Pict., Mayfly, *Ephemera danica* Müll., an imago and a nymph. The water bailiff, Mr. A. Storey, told me that there had been a good rise of Mayfly this year. Blue-winged Olive and Sherry Spinner, *Ephemerella ignita* (Poda) several imagoes and nymphs; Jenny Spinner, *Baetis pumilus* (Burm.) imagoes; *B.* sp. nymphs; Yellow Upright *Rhithrogena semicolorata* (Curt.) and the Yellow Hawk, *Heptagenia sulphurea* (Müll.). The Stoneflies included *Amphinemura sulcicollis* Steph., *Nemoura cambrica* Steph., *Leuctra inermis* Kemp., several. The Creeper, *Perla cephalotes* Curt., *Chloroperla torrentium* (Pict.) and Yellow Sally, *Isoperla grammatica* (Poda). The largest caddis was a female, Grey Sedge, *Odontocerum albicorne* Scop. Several larvae and pupae of *Rhyacophila* were taken as well as a number of unidentified larvae probably *Stenophylax*. *Agapetus fuscipes* Curt. in all stages was common and one male of *A. delicatulus* McL. is a new record for Yorkshire. *Silo pallipes* F., larvae and imagoes; *Tinodes dives* Pict., *Beraea maurus* Curt. Several pupae of *Hydroptila* were taken home and one male hatched out which proved to be *H. occulta* Eaton, new to V.C. 62 and the second record for the county. A few larvae of *Simulium* were taken in the small beck. It is remarkable that very few larvae of Chironomidae were seen.

From our observations it would seem that although there was a considerable number of different species, individuals were few with the exception of freshwater shrimp and *Agapetus*. It is possible that the paucity of animal life may be due to the shortage of plant life on stream and river bed and that the river banks may provide a good deal of the food for the aquatic invertebrates.

Flowering Plants (C. M. Rob): The woods around Helmsley are well known for the wealth of their flora, and are possibly better known than most places visited by

the Union; it is not surprising, therefore, that no new records were made on this occasion. Members of the Botanical Section enjoyed seeing the many rare plants under the skilled leadership of Mr. Adam Gordon, who had taken a great deal of trouble to locate some of the more difficult ones beforehand so nothing should be overlooked.

Near the Castle at Helmsley a fine show of *Cicerbita macrophylla* (Willd.) in good flower was seen, also *Cirsium arvense* (L.) Scop. var. *setosum* C. A. May. *Cystopteris fragilis* (L.) Bernh. occurred in several spots near Rievaulx, *Botrychium lunaria* (L.) Sw. near Ashberry and *Ophioglossum vulgatum* L. near Duncombe Park. *Cuscuta epithymum* (L.) Murr was searched for at the Rievaulx Terrace without success; the grass is now mown where the plant used to be plentiful. Last year one small piece was found, but on this occasion there was no sign of the Dodder and the *Thymus* has almost gone.

Some plants seen on the excursion included: *Aquilegia vulgaris* L., *Trollius europaeus* L., *Helleborus viridis* L., *Actaea spicata* L., *Arabis hirsuta* (L.) Scop., *Hypericum humifusum* L., *Malva moschata* L., *Geranium sanguineum* L., *Alchemilla glabra* Neygenfind., *Ribes alpinum* L., *Primula farinosa* L., *Symphytum peregrinum* Ledeb., *S. orientale* L., *Lithospermum officinale* L., *Pinguicula vulgaris* L., *Cirsium eriophorum* (L) Scop., *Crepis paludosa* (L.) Moench., *Gymnadenia conopsea* (L.) R.Br., *Ophrys insectifera* L., *Blysmus compressus* (L.), Link., *Schoenus nigricans* L., *Carex hostiana* DC., *C. lepidocarpa* Tausch., *C. rostrata* Stokes., *C. pallescens* L., *C. remota* L., and *Hordelymus europaeus* (L.) Harz.

The Ashberry valley is one of the few remaining stations for *Primula farinosa* in V.C. 62 and the flora of the surrounding woods is particularly rich, the majority of the rare plants being found in this part of the ground visited.

Bryology (J. Appleyard): The wet calcareous pastures of Ashberry, through which runs an arm of the River Rye, appeared to be a tract well worth investigating. Several mosses were found there in abundance though the number of species seen was small. *Philonotis calcarea* (B. & S.) Schp., *Cratoneuron filicinum* (Hedw.) Roth, *C. commutatum* (Hedw.) Roth, *C. commutatum* var. *falcatum* (Brid.) Moenk. grew in fine tufts and there was plenty of *Campylium stellatum* (Hedw.) Lange & C. Jens. in varying degrees of robustness. The most interesting moss was *Cratoneuron commutatum* var. *virescens* (Schp.) Richards & Wallace which occurred in large submerged masses in the stream, incrusted with calcareous deposit. Much of it was in poor condition but some was unusually fine. *Bryum pseudotriquetrum* (Hedw.) Schwaegr. was common in fruit. *Dicranella schreberiana* (Hedw.) Dix. was collected on a rutted trackway and *Barbula rigidula* (Hedw.) Mitt., barren but with plentiful gemmae, grew on stones with *Grimmia apocarpa* Hedw. and *G. pulvinata* (Hedw.) Sm. *Aplozia riparia* (Tayl.) Dum. occurred in a gravelly flush. On stones under a bridge there were *Fissidens pusillus* Wils. ex Milde, *F. crassipes* Wils. and *Hygroamblystegium tenax* (Hedw.) Jennings. Mosses noted in drier situations included *Anomodon viticulosus* (Hedw.) Hook & Tayl., *Rhytidiadelphus triquetrus* (Hedw.) Warnst., *Neckera crispa* Hedw. and *Dicranum scoparium* Hedw. c. fr.

Fungi (W. G. Bramley): At this time of the year one does not expect to see many of the larger fungi and a number of members remarked on the number of agarics seen. First to be noted was the ' Oyster of the Woods ' (*Pleurotus ostreatus* (Jacq.) Fr.) growing on at least two Beech trees. Later on a number of young *Amanita* were observed, probably *A. rubescens* (Pers.) Fr., of which a mature example was seen. Other agarics seen included *Russula nigricans* Fr., *Coprinus atramentarius* (Bull.) Fr., *Marasmius oreades* (Bolt.) Fr., and *Galera tenera* (Schaeff.) Fr.

In the same area as *A. rubescens* were two on three specimens of Boleti but with no means of getting these home they were not specifically determined. The feature of the Beech trees in Duncombe Park is the abundance of *Ganoderma applanatum* (Pers.) Pat. which ornament most of the dead and partially dead trees, many of which have more than a score of individuals.

Rusts and Smuts did not seem to be abundant, the most unusual being *Ustilago kuhneana* Wolff on *Rumex acetosa* and *U. tragopogonis-pratensis* (Pers.) Rous. destroying the ovaries of Goatsbeard. The latter plant was also the host of *Puccinia tragopogi* (Pers.) Corda (coll. Miss Rob). The primary uredosori of *Triphragmium* on Meadowsweet attracted the eyes of non-mycological members.

Some attention was paid to Discomycetes, the most outstanding being *Dasyscypha brevipila* Le Gal on wood (coll. Mrs. E. M. Morehouse), *D. grevillei* Mass., and *D. leucophaea* (Pers.) Mass. on *Myrrhis* stems. On old dead leaves of *Carex sp.* a fair quantity of *D. caricis* (Desm.) Sacc. was obtained.

NORTH CAVE, V.C. 61, July 11th

We were favoured with a fine day on this occasion, the lane sides along the six miles walk and the lime pits near at hand had a fine show of flowers. We were indebted to Miss Crackles for the work involved in preparing for the meeting. Perhaps the most interesting area was Hotham Carrs, and a small area near Duck Nest Farm provided some rather unexpected plants and insects.

A few mosses were found here, the main species being *Hypnum cuspidatum.* This seemed to replace the more usual *H. fluitans* which needed careful search. *Aulacomnium palustre* was widespread but in a dried-up state, whilst *Dicranum scoparium* and *Polytrichum commune* were present in small quantity.

The most interesting two-winged fly was the tipulid, *Prionocera turcica,* a lover of damp marshland but these insects were much darker in colour than they are normally and the red bases of their antennae were mostly all black and so misleading to a dipterist relying on this guide to the species, for there is a nearby related species which has all-black antennae. The only other dipteron was a stem borer, *Elgiva lineata,* which is additional to V.C. 61 diptera list, the only other Yorkshire record being from Pilmoor.

Flowering Plants (E. Crackles): The botanists proceeded by footpath to Dryham and then across the fields to Snake Hall.

Near North Cave, at the edge of a sandpit and in adjacent fields, was found an interesting association of characteristic species. The following plants were particularly plentiful: *Cerastium semidecandrum* L., *Trifolium arvense* L., *T. striatum* L., *Ornithopus perpusillus* L., *Aira praecox* L. and *A. caryophyllea* L. *Papaver argemone* L. was also noted here and plants found on similar terrain near Snake Hall included *Scleranthus annuus* L. and *Filaga minima* (Sm.) Pers.

In a sandy lane between North Cave and Dryham, the following species were particularly noteworthy: *Cerastium arvense* L., *Pimpinella saxifraga* L., *Anthriscus neglecta* Boiss. & Reut. and *Trisetum flavescens* L.

In one field that had been found uneconomical to cultivate, Viper's Bugloss (*Echium vulgare* L.) was found in abundance, making a wonderful show. *Apera spica-venti* (L.) Beauv. was also very plentiful here and in nearby cornfields the following species were also frequent: *Papaver dubium* L., *Vicia hirsuta* (L.) S. F. Gray, *Valerianella dentata* (L.) Poll., and *Chrysanthemum segetum* L. Other species noted included *Sisymbrium altissimum* L., *Melandrium noctiflorum* (L.) Fr., and *Agrostemma githago* L. At the edge of a dyke near Dryham a large patch of *Carex acutiformis* Ehrh. was noted.

North-west of Snake Hall Farm is a small stretch of heathland. A few Silver Birches and Oaks are present but the area bears mainly a grass association with *Nardus stricta* L. and *Festuca rubra* L. predominating. Heather (*Calluna vulgaris* (L.) Hull) is locally dominant. Other plants of this association are *Potentilla erecta* (L.) Raush, *Erica tetralix* L., *Pedicularis sylvatica* L., *Galium hercynicum* Weigel, *Juncus squarrosus* L. and *Carex nigra* (L.) Reichard.

We were pleased to find that the Bog Pimpernel (*Anagallis tenella* (L.) Murr.) is plentiful on wetter parts of the heath. In marshy ground by small but deep ponds on the heath were found *Ranunculus flammula* L., *Potentilla palustris* (L.) Scop., *Oenanthe fistulosa* L., *Galium palustre* L. and *Hydrocotyle vulgaris* L. frequently; also *Veronica scutellata* L., *Juncus bufonius* L. and *Eleogiton fluitans* (L.) Link. In one of these ponds *Ranunculus tricophyllus* Chaix ssp. *tricophyllus* B. & S. and *Apium inundatum* (L.) Rchb. were noted.

At North Cave, A. K. Wilson showed me a large patch of *Cicerbita macrophylla* (Willd.) flourishing at the corner of a lane where he first found it some years ago.

Ornithology (R. Chislett): A tract of ' carr ' including dykes, canal, heath with pines, birch, etc., and cultivated land, is sure to have a good population of birds in spring and we could well understand that Mr. E. B. Burstall found the present silence rather strange after the multitudinous sounds of a few weeks earlier. Even so evidence of 41 species was forthcoming. Among waders, Curlew, Snipe with flying

young, and Lapwing with well-grown young (two ringed) were noted. Mistle-Thrushes were plentiful. Finches included Goldfinch and Tree-Sparrow. Of buntings there were Corn, Yellow and Reed. Titmice included the Cole and the Willow. Common Whitethroat, Willow and Sedge-Warblers were the only warblers in evidence. A Green Woodpecker inspected our luncheon party, and the Great Spotted Woodpecker was heard. Kestrel and Sparrow-Hawk were only seen on a ' gibbet '. Partridges had young.

Lepidoptera (D. Wade):

Large White (*P. brassicae*)
Small White (*P. rapae*)
Small Tortoiseshell (*A. urticae*)
Meadow Brown (*E. jurtina*)
Ringlet (*A. hyperanthus*)
Hedge Brown (*E. tithonus*)
Small Heath (*C. pamphilus*)
Small Copper (*L. phloeas*)
Common Blue (*L. icarus*)
Small Skipper (*T. sylvestris*)
Large Skipper (*O. veneta*)
Smoky Wainscot (*L. impura*)
Common Wainscot (*L. pallens*)
Common Forester (*I. statices*)
Dark Arches (*X. monoglypha*)
Large Emerald (*G. papilionaria*)

Larvae seen of:
Cinnabar (*H. jacobaeae*)
Mullein (*C. verbasci*)

Cocoon taken of:
Eyed Hawk Moth (*S. ocellatus*)

BRETTON PARK AND CAWTHORNE, V.C. 63, July 25th

The last of the 1953 meetings attracted a good attendance of members due in a great measure to the Barnsley Naturalists. A pleasing and encouraging feature was the number of younger persons present. We were glad to see our oldest member, a founder of the Union, E. G. Bayford, at the meeting place with several others, both members and associates whose years were more than three score and ten, an assemblage pointing to the advantages to be gained by the study of natural history in the field.

In Bretton Hall Park the West Riding Education Committee gave us permission to explore the ample space and variety of the surroundings. The presence of long stretches of lake waters and of fine timber trees gave the ornithologists a long list of birds; the mycologists were also pleasantly surprised with the unexpected quantity of species. Flowering plants were restricted to the water sides where a fine show of flowers of the Skullcap mingled with the reeds and the Spearwort. The greater part was park-like, too tidy and well-grazed for wild flowers. Unfortunately a heavy drizzle started at noon about which time a start had been made to the next place on our list, Deffer Wood, but the wet vegetation had little attraction for the entomologists. A few hardy members then arrived at Cawthorne for Cannon-hall Park and here we had an unpleasant shock. Many of us had not been at Cawthorne for several years and the horror of the open-cast coal working must be seen to be appreciated. The lovely Cannon-hall Park from the village to the stream is one stretch of vile muddy mounds quite impossible even to think of crossing. The old-time path from the hall to the village ceases at the bridge over the stream and then desolation reigns. Luckily the lake-like stream has survived and its beauty is still there for one who can turn a blind eye to the devastation. Yellow waterlilies were in flower and the Marsh Woundwort and Spearwort mingled with Meadow-sweet and Forget-me-not, and in quiet corners Water-Starwort spread over the surface. Those of us who withstood the rain, vainly wished we had spent the fine morning in this pleasant spot. The tea and meeting were held long before the appointed 6 p.m. for members were all seeking shelter. Our Past President, H. Whitehead, was in the Chair and 22 Societies responded to the roll-call. Members, mostly from the Barnsley Society, reported on the day's activities. Mrs. Morehouse proposed a vote of thanks to the various landowners by whose permission our visit was made possible.

Ornithology Mr. T. D. Bisiker reports as follows: The day was fine until 1-15 p.m. when rain began, sometimes heavily, and conditions became anything but ideal. Forty-four species were identified, water-side birds predominating, and including Great-crested and Little Grebes, Mallard, Gadwall and Tufted Ducks, Canada Goose, Heron and Kingfisher. In the woods were Redstart and Chiffchaff. A flock of small birds included Great, Blue, Coal and Marsh-Tits, and Goldcrest. Kestrel and Tawny Owl were the only raptores noted.

Conchology (Mrs. E. Morehouse): Mr. S. G. Appleyard and Mr. Robinson gave special attention to the aquatic mollusca in Bretton Park Lake. These were not plentiful, probably due to the presence of waterfowl on the Lake.

The following were observed:

Anadonta cygnaea L.
Limnaea palustris Müll.
L. stagnalis L.
L. pereger Mull.
Planorbis vortex L.
Planorbis umbilicatus Müll.
P. carinatus Müll.
Sphaerium corneum L.
Paludestrina jenkinsi Smith

Botany. Messrs. C. Jukes and W. R. Barker noted 51 species of flowering plants from Cannon Hall Park, Deffer Wood and Cawthorne. These were all common wayside and woodland species. Mr. R. G. Collins also sends a short list of species from the lake in Bretton Park where the Sweet Flag, *Acorus Calamus* L. was noted.

Fungi (R. Watling):

Myxomycetes

Reticularia lycoperdon Bull.

Pyrenomycetes

Nectria cinnabarina (Tode) Fr.
Diatrype stigma (Hoffm.) de Not., on Sycamore.

Discomycetes

Coprobia granulata (Bull.) Boud., on cow dung.

Basidiomycetes

Amanita pantherina (DC.) Fr., under Beech
A. rubescens (Pers.) Fr., under Beech
Amanitopsis fulva (Schaeff.) W. G. Sm., under Birch
Russula fragilis (Pers.) Fr., in open spaces
R. azurea Bres., on path side
R. claroflava Grove, under Beech
Lactarius pyrogalus (Bull.) Fr. under Beech.
L. pallidus (Pers.) Fr. under Beech
Collybia velutipes (Curt.) Fr., on stump
C. platyphylla (Pers.) Fr., under Beech
C. radicata (Rehl) Berk., under Beech
Marasmius oreades (Bolt.) Fr., on grassy plot
Pleurotus ostreatus (Jacq.) Fr., on Beech stump
Omphalia rosella Lange, on grassy plot
Entoloma jubatum Fr., under Beech
Stropharia semi-globata (Batsch) Fr., on cow dung
Annellaria semi-ovata (Sow. ex Fr.), on cow dung
Panaeolus campanulatus (Linn.) Fr., on cow dung
Paxillus involutus (Batsch) Fr., under trees
Strobilomyces strobilaceus (Scop.) Berk., under trees
Boletus elegans (Schum.) Fr., under Larch
B. chrysenteron (Bull.) Fr., under Beech
B. subtomentosus (Schaeff.) Fr., under Beech
Polyporus squamosus (Huds.) Fr., parasitic on Sycamore
P. betulinus (Bull.) Fr., parasitic on Silver Birch
Ganoderma applanatum (Pers.) Pat., parasitic on Beech
Polystictus versicolor (Linn.) Fr.
Stereum hirsutum (Willd.) Fr.
S. purpureum (Pers.) Fr.
S. rugosum (Pers.) Fr.
Phallus impudicus (Linn.) Pers.
Scleroderma aurantium Pers.

SPRING FORAY, MARCH 21st-24th, 1953

W. G. BRAMLEY

The Spring Foray of 1953 proved to be most enjoyable and numerically the attendance was a record since these early forays were resumed, over thirty collectors taking the field. Our thanks are due to the Leeds University authorities, who not only provided laboratory facilities, but also placed accommodation at Woodsley Hall at our disposal and saw that the inner man was adequately equipped for the fray.

The attendance owed much to Professor Chesters and Mr. J. Webster who brought students from Nottingham and Sheffield. We must not forget the three young lady students who came from far-off Bristol, though we missed Dr. Bond since his removal from Sheffield to Bristol. All this would have been of little avail if Dr. Sledge had not made all the arrangements for such a successful meeting.

The first two days were devoted entirely to collecting. A short business meeting was held on the Saturday evening. The last day was spent in the laboratory working out the collections.

Bramham Park proved to be rather disappointing from a mycological point of view. Conditions in the preceding months had been rather dry and cold and even the normally wet slacks were on the arid side. To those who had previous experience of these woods in autumn the paucity of fungi was disappointing and the normal search for microspecies had to be intensified.

The larger fungi were not to be expected in numbers but a small grove of willows was notable for the many specimens of *Fomes igniarius* (Linn.) Fr., a species which has not been recorded for a long time. Accompanying these were a small number of *Trametes rubescens* Fr., which has previously only been obtained in Yorkshire at Askham Bog. Somewhat unexpected was a small colony of *Mycena alcalina* Fr. Of the smaller fungi a number are not recorded for Yorkshire and these are indicated in the following list. Sycamore is a new host for *Camerops*. *Gonytrichum caesium* Nees is the conidial stage of *Eriosphaeria inaequalis* Grove, as proved by cultures made by E. W. Mason from Yorkshire material of the latter in 1937. *Hypoxylons* were not only few in number but scarce in quantity and Professor Chesters remarked that if this genus was scarce most other things would be and it certainly was so on this occasion.

The following is a list of the more uncommon species found and the writer is grateful to all members and visitors who helped with both the collecting and naming.

†=not in Mason & Grainger.
*=not in Mason & Grainger for V.C. 64.
S=specimens in Herbarium Sheffield University.

PYRENOMYCETES

**Anthostoma melanotes* (B. & Br.) Sacc.
†*Camerops tubulina* (A. & S.) Shear, on Acer (=*Nummularia lutea*).
Chaetosphaeria phaeostroma (Mont.) Fckl.
†*Cryptosphaeria eunomia* (Fr.) Fckl., on *Fraxinus*.
**Didymella tosta* B. & Br., on *E. angustifolium*.
†*Ditopella ditopa* (Fr.) Schroet., on *Alnus*.
Eutypa acharii Tul.
†*E. flavovirens* (Pers. ex Fr.) Tul.
†*E. lata* (Pers. ex Fr.) Tul.
†*E. spinosa* (Pers. ex Fr.) Tul.
†*Farlowia carmichaeliana* (Berk.) Sacc., on *Quercus*.
S *Gnomonia setacea* (Pers.) Ces. & de Not., on *Caltha* petioles.
†*Leptosphaeria derasa* (B. & Br.) Auersw., on *Senecio*.
S†*Lophiotrema praemorsum* (Lasch.) Sacc., on *E. angustifolium*.
†*Massarina eburnea* (Tul.) Sacc., on *Fagus*.
S†*Microthyrium culmigenum* Syd., on *Dactylis*.
S†*Nectria pallidula* Cke., on *Fagus*.
S†*Pleospora infectoria* Fckl., on *Hordeum* (Barley).
S†*P. trichostoma* (Fr.) Fckl., on *Hordeum*.
S†*P. vagans* Niessl, on *Linum* (cult.).
S**P. vulgaris* Niessl, on *Calamagrostis*.
Rosellinia velutina Felk.
S†*Valsaria foedans* Karst., on *Castanea* (det. E. W. Mason).
Zignöella pulviscula (Curr.) Sacc.

DISCOMYCETES

†*Dasyscypha brevipila* Le Gal., on *Fagus*.

MONILIALES

†*Catenularia cuneiformis* (Rich.) Mason
S†*Cheiromycella gyrosa* (Cke. & Mass.), on conifer wood.
**Gonytrichum caesium* Nees ex Wallr.
S†*Menispora tortuosa* Corda, on *Quercus* bark.
S†*Oidiodendron griseum* Robak, on *Fagus*.
S†*Septonema secedens* Corda, on *Betula* bark.

MELANCONIALES

S†*Colletotrichum lineola* Corda, on *Calamagrostis*.
S†*Septoria alopecuri* var. *calamagrostidis* Grove, on *Calamagrostis*.

AGARICALES—POLYPORACEAE

Fomes igniarius (Linn.) Fr., on *Salix*.
Trametes rubescens (A. & S.) Fr., on *Salix*.

BOOK REVIEWS

The Algae of Illinois, by **L. H. Tiffany** and **M. E. Britton.** Pp. xiv+407, with 108 plates containing 1,186 drawings. Published by University of Chicago Press and obtainable from Cambridge University Press, 1952, 75/-.

The State of Illinois is approximately the same size as England. Algal habitats are varied, for though many of the ponds and pools which abounded in the original flat prairie grassland and were rich collecting grounds have now been lost through drainage, there remain extensive areas of swamp and marsh and occasional peat bogs. Flowing waters range from small streams to the rivers Illinois and Mississippi while Lake Michigan constitutes one of the world's largest freshwater lakes. Only in the absence of mountainous country is there a notable gap in the range of algal habitats.

In 1944 M. E. Britton published a *Catalogue of the Algae of Illinois*. In the present work the algal flora is treated in the manner of a flora of vascular plants, with full descriptions of all classes (except Charophyta), families, genera and species, and dichotomous keys to the genera and species, whilst all the species are clearly illustrated. The distribution of most freshwater algae is so cosmopolitan that this work will have a utility extending far beyond the confines of its chosen area. For example, of the eighteen species of *Spirogyra* listed in W. and G. S. West's *Algal Flora of Yorkshire*, seventeen are described and figured here; and so with many other genera. Indeed, this book will be of value to all students of freshwater algae for the diffuse literature dealing with algal taxonomy constitutes one of the chief difficulties confronting systematic workers. Most of the illustrations have been redrawn from authoritative sources and both their execution and clarity of reproduction are alike excellent.

W. A. S.

The Metabolism of Algae, by **G. E. Fogg.** Methuen's Monographs on Biological Subjects. Pp. 149. Methuen & Co. Ltd. 8/6.

Dr. Fogg is to be complimented on producing in a very small volume, a very readable, lucid and up-to-date account of a study which has become exceedingly complex indeed. The central position of the algae in modern work on metabolism makes this book an account not only of the features of this group of plants, but also an account of metabolism in general.

The book is divided into eight chapters, of which the first five deal with phototropic and chemotropic assimilation of carbon and nitrogen, the sixth chapter with products of metabolism and the seventh with growth and metabolism. It forms a very useful summary of modern views of many aspects of metabolism and no botanist interested in this side of plant science can afford to be without it. It will form heavy reading for students but is nevertheless to be warmly recommended and will repay any effort they may put into the understanding of it. A notable feature of the book is the very comprehensive list of literature references, amounting in all to 309.

R. D. P.

The Changing Flora of Britain, edited by **J. E. Lousley.** Pp. 204 with 6 plates and 25 text figures. Published by the Botanical Society of the British Isles, c/o Dept. of Botany, The University, Oxford, 1953. 15/-, plus postage 8d.

In the spring of 1952 the Botanical Society of the British Isles arranged a two-day Conference in London when a series of papers was read and exhibits arranged around the theme which forms the title of the present work. The Society has done well to publish these papers and the discussions to which they gave rise for they contain much useful information. Contributors' approaches to the subject are diverse and the contents cover a considerably wider range then the title of the book suggests for overseas speakers deal with problems connected with the French, Dutch and Scandinavian floras. Several contributors, including Dr. H. Godwin, deal with post-glacial vegetation changes. Two very interesting papers by Sir Edward Salisbury and Mr. J. E. Lousley discuss recent changes shown by the spread of weeds of arable land and waste places, and by the influx of alien plants introduced by trade, commerce and other means. Professor A. R. Clapham examines the ecological evidence for assessing the status of some wayside and hedgerow plants such as Coltsfoot, Goutweed and Hedge Parsley, now largely confined to artificial habitats. Dr. J. Heslop-Harrison makes an important contribution to the much-discussed problem of the North American and Lusitanean Elements in the flora of the British Isles. Dr. Melderis discusses ' Some Parallels between the British and Scandinavian Mountain Floras ' and Dr. Maurice Burton contributes a paper on 'A Zoologist's Approach to a Changing Flora'. Dr. S. M. Walters, Dr. E. F. Warburg, Sir Arthur Tausley and Canon C. E. Raven are included amongst the other contributors.

Studies on British Beechwoods, by **J. M. B. Brown.** Forestry Commission Bulletin, No. 20. Pp. iv+100, with 26 photographic illustrations and two figures. H.M. Stationery Office, 1953, 12/6.

This bulletin gives the results of a comprehensive survey of British beechwoods carried out by Mr. Brown from 1948-50. It gives a full account of the history of the tree in Britain, the ecological classification of British beechwoods, silvicultural practices in relation to different types of site, and problems affecting natural regeneration and artificial establishment under various conditions of soil and situation. Consideration is given to the insects, fungi and rodents which cause damage to beech and affect regeneration. This survey should prove of great value to foresters and those selecting sites for planting ornamental beech and much of the material is of general natural history interest.

L. I. S.

Bibliography of Key Works for the Identification of the British Fauna and Flora. Edited for the Systematics Association by **John Smart and Geo. Taylor.** 2nd Edn., pp. xii+126. Obtainable from the Treasurer of the Systematics Association, c/o British Museum (Natural History), Cromwell Road, London, S.W.7. 12/6.

The first edition of this useful work was published in 1942 and reviewed in *The Naturalist*, 1943, p. 64. That edition being now exhausted a second edition which incorporates numerous additions and improvements has been prepared. The zoological and entomological sections have been revised and brought up to date by inclusion of papers published up to 1951. The botanical part has been practically re-written. The section dealing with monographs of special groups in the flowering plants for example has been enlarged to six times its former length and in place of a section on wood anatomy one on works dealing with pollen identification has been substituted. The mycological section also is much improved and has been enlarged from seven to fourteen pages.

Entomological Photography in Practice, by **E. F. Linssen,** Pp. 112, with 50 photographs and 54 text-figures. Fountain Press, London, 1953. 32/6.

If we deduct the index, glossary of entomological terms, list of entomological books, and in addition the chapters on ' Collecting and Rearing specimens ' and ' Entomological Considerations ' as being matters adequately covered by other publications, there remain only about 66 pages dealing with the actual technique of insect photography and the price of the book, 32/6, in consequence, seems to be an excessively high one, even in these days of inflated printing costs.

Much of the purely photographic information provided doubtless can be obtained from the standard photographic manuals but the author's presentation of it in conjunction with insect materials provides a useful combination which does not appear to have been previously achieved. The emphasis is on close-up studies and is directed towards the production of an artistic photographic record comparable with those achieved in modern ornithology. Indeed the 50 photographs (on 12 plates), many of which are entomological in subject matter, are very high-grade productions of the type most suitable for the purpose of illustrating popular books.

W. D. H.

The British Journal of Animal Behaviour, Vol. 1, No. 2. Pp. 41-90. Balliere, Tindall & Cox, Ltd. Annual Subscription, 27/6.

This is the second number of a new journal the first of which was reviewed earlier in our pages. It contains a variety of papers including a synopsis of a Symposium held under the auspices of the Association for the Study of Animal Behaviour on whose behalf the journal is published. The Symposium was concerned with some behavioural aspects of shore ecology and the papers given were mainly about the responses of various molluscs and polychaete worms.

The issue also contains the substance of an address on ' Heredity and Environment in Mammalian Behaviour ' by D. O. Hebb of McGill University in which he stresses the ' inextricable tangle ' of the two influences. There are further papers on the grazing behaviour of cattle, on the adaptability of homecoming honeybees when entrance to the hive was subjected to change, and on the mating display and behaviour of the Black Grouse. This latter paper is as much a recapitulation of the work of others as a record of original observation and parts of it are so badly written as to be practically incomprehensible. One cannot expect every gifted observer to be an expert in exposition but surely editors have more than a nominal rôle? E. H.

The Overloaded Ark, by **Gerald M. Durrell.** Pp. 238, with 24 plates and map. Faber & Faber, 1953, 15/-.

A year or so before the war, Ivan Sanderson made a collecting trip to West Africa mainly to bring back alive examples of the smaller animals which make up the bulk of the collections of various zoos and which are often of greater interest to the zoologist than are the more spectacular larger carnivores and primates which have more general appeal. On his return, Sanderson described his expedition in a book, entitled *Animal Treasure,* which had the merit of novelty, a modicum of natural history and a certain ' panache ' which make it very readable.

Mr. Durrell has also made a trip to the Cameroons for the same purpose, since the war, and has also retailed his adventures. The ingredients are the same—the smaller mammals, amphibians and reptiles, West African assistants who converse in pidgin (' Massa, I done bring you fine beef ' ' I bring Massa best beef Massa get for this country.' ' Beef ' being anything that hath breath), and the same driver-ants, risks, falls, bites and escapes. It is not, however, so well written, being at times plainly ungrammatical. On the other hand it is more revealing about the large numbers of animals, especially birds, which are hopelessly maimed at capture by natives anxious to sell to the collector and of the numbers of animals which do not survive the first few days of captivity.

The *via dolorosa* which in some circumstances can be the path to the zoological gardens is less often considered by those sentimentalists who stigmatise the more immediate killing of animals for museum purposes, which in the long run is less wasteful and more humane. E. H.

Shark-O! by **Fitzgerald O'Connor.** Pp. 272, with 7 plates and 5 maps. Secker and Warburg, 15/-.

The great plankton-eating basking sharks which frequent the western coasts of Scotland and Ireland are the second largest fish in the sea. In this book an account is given of three months spent in hunting them amongst the Western Isles, from a small converted harbour launch fitted with harpoon gun and a factory ship improvised from a metal life-boat. The financial problems of the enterprise were met by the liver-oil obtained, but adventure and excitement were the real motives behind the venture. Unfortunately the excitement of ' shark fever ' has so affected Mr. O'Connor that he wears his reader out by the shrillness of his style. Apart from

the manner of writing the contents will appeal more to those who enjoy hunting than to naturalists.

How Animals Move by **James Gray.** The Royal Institution Christmas Lectures, 1951, Pp. 118, plates xv. Cambridge University Press, 1953, 16/-.

Professor Gray originally delivered the matter of this book in six lectures to a juvenile audience, in accord with the established policy of the Royal Institution. They deal mainly with the mechanics of locomotion but include also such sensory aids as the lateral line in fishes, the electric fields of some highly specialised fishes and the supersonic emissions of bats.

On the whole, the subject is discussed in generalised terms and Professor Gray is careful to point out that these are susceptible to exceptions. It is difficult to assess for what level of reader the book is intended since the spoken word was amplified and clarified at the lectures by demonstrations of working models and of living material without which it will be somewhat heavy going for juvenile readers. On the other hand, the matter is somewhat elementary for more advanced students. It can best, perhaps, be recommended to those who may cull from it teaching material for audiences of the same age groups as those for whom it was originally intended.

E. H.

Observations on Starling Natural History, by **Clifford J. Smith** (64 pp. of duplicated typescript $8\frac{1}{4} \times 10\frac{1}{2}$) is based on the work of the Bootham School N.H. Club in 25 years of ringing, during which of 347 British-ringed Starlings recovered outside this country some 10% were ringed by Bootham School. Much ringing has been done at roosts as well as of trapped birds and of occupants of nesting-boxes. Results are tabulated and considered, and other aspects of the Starling dealt with, such as age and seasonal morphological changes, and the life of the species through the year. Literature has been studied and the work of other naturalists is cited, notably that of R. Carrick. The school and the author are to be congratulated on a modest but useful contribution to our knowledge of the species. Copies may be obtained, price 2/6 each, from C. J. Smith, Bootham School, York.

The Observer's Book of Common British Insects and Spiders, by **E. F. Linssen** and **L. Hugh Newman.** Pp. 128, with 64 plates, 32 in full colour, comprising 322 figures. Frederick Warne & Co. Ltd., London, 5/-.

This pocket-book gives an outline of all the British orders of insects and concludes with a few pages on spiders. As even the most extensive orders are covered in ten pages or less, treatment must be very general, yet the authors have packed a surprising amount of valuable information into this little volume. Most of the photographs and line drawings are excellent but the difficulty of accurate colour matching is illustrated by the Cardinal Beetle and *Cantharis abdominalis* on plate 38. It is also questionable whether *Carabus violaceus* and *C. nemoralis* would be correctly separated on the illustrations on plate 32. These points however are minor criticisms. Schoolboys will welcome this additional member of the well-known Observer's Series and adults with find that this is a volume that gives a useful overall impression and is a handy book of reference. It is certainly good value.

The Amateur Entomologists' Society has done a great service towards encouraging young naturalists by the publication of a series of short bulletins on collecting and preserving the various insect groups. Bulletin No. 26, 1953, by **Peter R. Barratt** on **Collecting Collembola** (obtainable from A.E.S., 1 West Ham Lane, London, E.15, price $1/1\frac{1}{2}$, post free) gives many useful practical hints on collecting and preserving spring-tails and also short notes on habitat, life cycle, dispersal and injurious species. A key to sub-orders and families and a short bibliography point the way to further study.

Filmstrip: Summer Moths (2). Photography and Notes by **G. E. Hyde.** Educational Productions, Ltd., East Ardsley, Yorks., 15/-.

This is a complementary title to the filmstrip on Summer Moths issued last year. The 28 frames depict 13 species of moths belonging to several families. Eggs, caterpillars, pupae and adults of both sexes are collectively illustrated. The last frame shows a female Ichneumon-fly. The photographs are very clear and the notes supplied for the teacher give the appropriate information on where to look for and how to recognise each species.

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Circular No. 530

Yorkshire Naturalists' Union.

President:

E. W. MASON, M.A., M.Sc., F.L.S., Commonwealth Mycological Institute, Kew, Surrey.

Hon. Treasurer:

J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

General Secretary:

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

The Eighth Spring Mycological Foray

WILL BE HELD AT

LEEDS

From MARCH 21st to 24th, 1953

For the investigation of Bramham Park Woods.

ACCOMMODATION will be reserved at Woodsley Hall, Clarendon Road, one of the University Halls of Residence, which is situated close to the University. Single bedrooms will be available. Terms, 16/6 per day, full board.

Members desiring reservation of accommodation should write to Dr. W. A. Sledge at the **earliest opportunity** and in any case not later than March 11th.

LABORATORY FACILITIES will be available at the Department of Botany, Leeds University, by kind permission of Professor I. Manton.

EXCURSIONS.—It is proposed to spend Saturday and Sunday collecting in the woods at Bramham Park which are easily accessible by public transport services. Monday will be devoted to examination of material at the University.

The Bramham Park woods are very extensive and spread over the junction of the Magnesian limestone and the grit rocks. They are the most rewarding hunting ground in the district for the larger autumn fungi and may be expected to yield equally good results in the micro-fungi.

The President, Mr. E. W. Mason, and Professor C. G. C. Chesters, will attend the meeting.

Keen beginners in the study of micro-fungi will be welcomed.

Will members please note that owing to the University term ending on March 20th it has not been possible to arrange for accommodation on the Friday night. Alternative arrangements for this night for those coming from a distance and who would otherwise be prevented from joining the excursion on Saturday, will be made on request. Others should meet at the entrance to Bramham Park on the Leeds-York Road a little west of Bramham Cross Roads, at 11-15 a.m. Buses to York leave the Bus Station in Vicar Lane, Leeds, on Saturdays at a quarter to, and a quarter past the hour, and every quarter of an hour after 10-45 a.m. Time required for journey, half an hour. Intending later arrivals should notify the Secretary (Miss J. Grainger) or Dr. Sledge and arrangements will be made to meet them and conduct them to the rest of the party.

Circular No. 531

Yorkshire Naturalists' Union.

President:
E. W. MASON, M.A., M.Sc., F.L.S., Kew.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Assistant Secretary:
K. G. PAYNE, B.Sc., A.R.C.S., York.

Divisional Secretary:
C. M. ROB., F.L.S., Catton Hall, Thirsk.

The 531st Meeting

WILL BE HELD AT

GRINTON

(for REETH, V.C. 65)

From Friday, MAY 22nd to Monday, MAY 25th, 1953

HEADQUARTERS.—The Bridge Hotel, Grinton, Richmond, Yorks.

TERMS.—24/- per day.

Other accommodation in Reeth:
The Laurels Private Hotel, £1/1/- per day;
Fairholme Private Hotel, 15/- per day
Burgoyne Private Hotel, 19/- per day.

There is also a Youth Hostel at Grinton Lodge, about three-quarters of a mile from Headquarters.

TRAVEL.—There is no railway to Reeth. Buses run from Richmond, which can be reached by train from Darlington or by bus from Darlington, Northallerton, and Ripon (*via* Leyburn).

Buses leave Richmond: 9-20 and 11-20 a.m., 3-15, 5-20 and 8-20 Friday.
10-20 a.m., 12-20, 3-15, 5-20, 8-45 and 10-30 p.m., Sat.
2-20, 6-30 and 9-0 p.m., Sunday.
,, leave Reeth: 8-20, 9-40 a.m.; 2-20, 4-25, 5-0 p.m. Friday.
8-20, 9-40, 10-20 a.m., 12-50, 1-20, 4-25, 5-50, 7-50 Sat.
1-20, 5-50, 8-20 p.m. Sunday.

MAPS.—The one-inch Ordnance Survey (New popular edition). Sheet 90, Askrigg and Settle covers the area to be visited.

Grinton lies three-quarters of a mile from Reeth on the Richmond road, where it crosses the River Swale. Grinton Lodge Youth Hostel is about the same distance from the Bridge, on the Leyburn road. The Arkle and Swale join just above the bridge, and there is interesting country along the banks of both streams. Fremington Edge overlooks the town of Reeth and should be worth a visit. There are several wooded Gills, in addition to the main streams. The proposed routes will be announced at Headquarters on Friday evening.

VERTEBRATE ZOOLOGY.—J. P. Utley: It is not expected that anything unusual will be seen; one or two Foxes may have evaded destruction and Badgers have been recorded; Hare, Rabbit, Stoat, Weasel, Brown Rat, and Field Mice may all be seen.

I have little knowledge of Toads or Newts in the district, but Frogs and Lizards are to be found. Brown Trout are the main stock of the Swale, Arkle Beck and some tributary streams. Grayling can also be caught.

ORNITHOLOGY.—J. P. Utley, M.B.O.U.: In common with other dale areas the total number of any one species may not be large but there is often a very good variety. The Coroides may not be seen in any quantity and the percentage of Carrion Crows may seem high: Ravens have been seen, Lesser Redpoll and Bullfinch have been found and breeding Twites located on the high moorland. In the Valley bottom and up some of the copse-strewn Gills a goodly number of Willow Warblers may be expected, Wood Warbler and Sedge Warbler may be recorded. I have not yet established the breeding of Chiffchaffs, though passage birds have been noted. In most years Wheatears are fairly common and Ring Ousels more prevalent than in many similar districts. Whinchats are not numerous, and I have not recorded a Stonechat in the district; Robins have been found breeding at an altitude of 1760 feet not very far away. On the high ground there will be Curlew, Snipe, Golden Plover and Lapwing; the latter will be in lowland meadows, etc. By the streams Dipper, Kingfisher, Grey Wagtail and Sandpiper are almost certainties, while Yellow Wagtails frequent upland pastures. Short eared Owls have bred in the uplands. Both Merlin and Common Buzzard have been known to breed within reasonable distance of Reeth and may be seen. It is not thought that many Avatidea will be noted, though an odd Mallard may be put up. Black Headed Gulls breed on some of the Tarns. Game Birds may not be plentiful, but Black Grouse have been noted in the area.

ENTOMOLOGY.—W. D. Hincks, M.Sc., F.R.E.S.: Swaledale at the end of May is a most attractive area for entomologists, particularly those interested in the aquatic Mayflies, Stoneflies and Caddis Flies. It is well known that V.C. 65 is entomologically the least worked part of the County, and we know relatively little of the insect fauna except in so far as it is recorded in reports of previous visits of the Union. It is perhaps a little early in the season to find the beetles of the district at their best and it might be advisable to concentrate on the littoral fauna of the Swale and Arkle Beck with a passing glance at the Sallow catkins and any other blossom which may be out. Lepidopterists will also find that the Sallows repay examination, and the early Aculeate Hymenoptera (*Andrena, Halictus* and *Nomada*) often swarm on the catkins on sunny spring days.

At this time of the year many interesting species of beetles, Gall-wasps and other groups of parasitic Hymenoptera and Diptera may be taken on the wing with a light net, especially in marshy places or at the edges of woods. If a position is taken up more or less facing the sun even very small species may be seen quite easily, and netted in considerable numbers without moving from the selected spot.

BOTANY.—Bryology.—Mrs. J. Appleyard: Mosses.—Baker's North Yorkshire records many rare and interesting mosses from Upper Swaledale. Most of these were made by R. Barnes, and no substantial additions have been made since. Kisdon Scars and Kisdon Force, Whitsundale and ' near Richmond ' are the localities most often mentioned. *Diphyscium foliosum, Dicranella subulata, D. varia* var. *callistoma, Seligeria doniana, S. pusilla, S. acutifolia* var. *longiseta, Tortella nitida*

Orthotrichum stramineum, O. tenellum, O. pulchellum, Ulota drummondii, Bartramia pomiformis var. *crispa, Pterogonium gracile, Campylium protensum, C. sommerfeltii, Hygroamblystegium fluviatile, Amblystegiella confervoides, A. sprucei, Rhyncostegiella teestalei* are given in Baker. *Trans. of the Y.N.U.* add *Fissidens crassipes, F. rufulus* and *Grimmia montana* (between Farngill and Reeth). *Thuidium delicatulum* should be looked for in suitable situations. *Metzgeria pubescens, Cololejeunea calcarea* and *C. rossettiana* are given for Kisdon. It is probable that the list of hepatics for this area can be considerably extended.

FLOWERING PLANTS.—C. M. Rob: The Swale valley is always later than the more open dales of the Wharfe and Ure, and little can be expected so early in the season; the botanists will do well to concentrate on a study of the Ecology of the area. *Equisetum hyemale* occurs near the Bridge Hotel, where it may have been washed down from the Gill above Reeth, where it was recorded by Baker. *Thlaspi alpestre* is at the old lead workings along Fremington Edge, *Arabidepsis thalisana* is common on old walls all around Grinton, *Viola lutea* is near Arkleside, *Minuartia verna* on old lead workings and also sandy ground near the Swale, *Lathraea squarmaris* is fairly abundant in some parts of the area, and *Salix purpurea* is the common willow of both Swale and Arkle banks.

The list of plants is Baker's *North Yorkshire* for the Arkengarthdale area, including Punchards Gill, is impressive, but there is little hope of finding many so early, but some may be recognisable; these include *Thalictrum montanum, Hornungia petraea, Draba incana, Sesleria caerulea* and *Cryptogramma crispa.*

Between Grinton and Whitta is a patch of Juniper, and Mr. Cheetham sends the following note :

Juniper in Swaledale.—C. A. Cheetham: A feature of the plant life of the area that should be investigated on this occasion is mentioned in Baker's *North Yorkshire.* Under Juniper he says ' This and the Rowan have the widest vertical range of all the trees. Juniper and Yew are with us *par excellence* bushes of the mountain limestone tract, Juniper being more especially prominent in Teesdale, the Yew in Swaledale.' He mentions Gunnerside Gill, Punchards Gill, and Booze Moor.' In *The Naturalist,* 1937, p. 169, Mr. Malins Smith drew attention to the Juniper of the Swale district, and mentioned Harkerside Moor as an interesting area. As Whitsuntide is too early for most flowering plants the trees may provide a matter of interest to the botanists, and the amount of Yew and Juniper should be noted.

MEETINGS.—There will be a meeting at Headquarters on the Monday at 5 p.m. for Reports, election of new members, etc.

The Next Meeting of the Union will be at Collingham, V.C. 64, on June 13th, 1953.

CIRCULAR No. 532

Yorkshire Naturalists' Union.

President:
E. W. MASON, M.A., M.Sc., F.L.S., Kew.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Assistant Secretary:
K. G. PAYNE, B.Sc., A.R.C.S., York.

Divisional Secretary:
H. M. RUSSELL, F.R.E.S., 17 Stainbeck Lane, Leeds 7.

The 532nd Meeting

WILL BE HELD AT

COLLINGHAM

(V.C. 64)

(For the investigation of Linton Common, Woodhall Bridge and Langwith Scrubs).

On Saturday, JUNE 13th, 1953

MEETING PLACE.—Old Star Inn, Collingham. Will members please write to Mr. Miles, Old Star Inn, Collingham, ordering meals. The charges are as follows, viz.:—Lunch 5/-, Plain Tea 2/-, High Tea 4/6.

PERMISSION.—Mr. John W. Catlow, Headmaster, Woodhall School, near Wetherby, has given permission for members to enter the grounds of the School, which are situated near to Woodhall Bridge.

TRANSPORT.—Collingham is best approached from Leeds. A regular bus service operates from Vicar Lane Bus Station, the times being as follows:—

LEEDS—EAST KESWICK—WETHERBY SERVICE.

Leeds (dep.)	9-30 a.m.	Arrive Collingham (Institute)	10-06 a.m.
,, ,,	10-30 a.m.	,, ,, ,,	11-06 a.m.

LEEDS—WETHERBY SERVICE.

Leeds (dep.)	9-45 a.m.	Arrive Collingham (Institute)	10-16 a.m.
,, ,,	10-15 a.m.	,, ,, ,,	10-46 a.m.

Return journey—Buses at approximately 15 minute intervals from the Institute, Collingham.

MEMBERS.—Meet at Old Star Inn at 11 a.m. in order to move off not later than 11-20 a.m.

LUNCH.—A stop will be made at Woodhall Bridge at approximately 1 p.m. when members who have been unable to join up with the morning party will be able to link up. A bus leaves Leeds at 12-30 p.m. and arrives at East Keswick at 12-58 p.m. which will enable latecomers to join the party.

MAP.—Ordnance Survey one-inch Tourist Map of the Ilkley District.

BOTANY.—Dr. W. Sledge: The limestone pastures on the north side of the river at Linton Common, though now reduced in area due to building, still yield many interesting plants of which *Orchis ustulata* and *Carex ericetorum* are the most noteworthy. *Helleborus viridis* and *Aquilegia* grow in a hedge bank nearby and the commoner limestone species such as Rock-Rose, *Viola hirta*, *Carex caryophyllea* and *C. flacca*, *Bromus erectus* and *Brachypodium pinnatum* are abundant. Both the Bee and Fly Orchid used to grow on Linton Common, together with *Astragalus danicus*, *Asperula cynanchica*, and *Spiranthes autumnalis* but their presence now requires confirmation.

In Langwith Scrub, the wooded slope on the south side of the river above Collingham, there is plenty of *Helleborus viridis* and *Cardamine amara*, *Adoxa* and *Equisetum Telmateia* grow there. Higher up the river near Woodhall Bridge, Toothwort and both *Polystichum aculeatum* and *P. setiferum* are to be found while near the bridge itself is a large colony of pistillate *Petasites ovatus*.

Other species which should be seen during the excursion include Spindle Tree, White and Black Bryony, Marjoram and Clustered Bellflower whilst *Thalictrum minus* (agg.), *Stellaria nemorum*, *Rhamnus catharticus*, *Genista tinctoria*, *Echium vulgare*, *Lithospermum officinale* and *Allium Scorodoprasum* are amongst the other recorded species.

FRESHWATER BIOLOGY.—H. Whitehead: The River Wharfe at Collingham is slightly alkaline, free from industrial pollution and has a varied river bed. The vegetation on the banks, too, make favourable conditions for aquatic insects and a good list of records is available. The Mayfly (*Ephemera danica*) will be seen in various stages known to fishermen as the Green Drake (sub-imago) and the imagoes Grey Drake (female) and Black Drake (male). Another striking mayfly is the lemon yellow sub-imago of *Heptagenia sulphurea*—the Yellow Hawk of the angler. This should be a favourable time for seeing the large Perlas—*P. carlukiana* and *P. cephalotes*. In addition the following species have been recorded:—

Ephemeroptera (Mayflies)

Turkey Brown (*Paraleptophlebia submarginata*), Blue Winged Olive and Sherry Spinner (*Ephemerella ignita*), Yellow Upright (*Rhithrogena semicolorata*), *Baetis bioculatus*, *Habrophlebia fusca* and *Procloeon rufulum*.

Plecoptera (Stoneflies)

Yellow Sally (*Isoperla grammatica*), Willow Fly (*Leuctra geniculata*) and *L. fusca*.

Trichoptera (Caddisflies)

Ecclisopteryx guttulata, Welshman's Button (*Sericostoma personatum*), *Goera pilosa*, Silverhorns (*Leptocerus annulicornis*, *L. cinereus* and *Mystacides nigra*), *Polycentropus flavomaculatus*, Sand Fly (*Rhyacophila dorsalis*), *Glossosoma vernale*, *Agapetus fuscipes*, and *Hydroptila forcipata*.

CONCHOLOGY.—S. G. Appleyard: (Nomenclature follows 1951 Census of Conch. Soc. of Gt. Brit.) This district should yield many species, especially on the wooded slopes along the river beds. Records compiled by the late Mr. W. Thurgood for the Leeds Naturalists show that the following may be taken:

Theodoxus flaviatile (L.), *Anodonta cygnea* (L.), *A. anatina* (L.), *Ancylus fluviatilis* Müller, *Succinea pfeifferi* Rossmässler, *Helix aspera* Müller, *H. hortensis* Müller, *H. nemoralis* Linné, *Helicella caperata* (Montagu), *H. itala* (L.), *H. virgata* (da Costa), *Hygromia hispida* (L.), *H. striolata* (C. Pfeiffer), *Monacha cantiana* (Montagu), *Arianta arbustorum* (L.), *Oxychilus helveticus* (Blum), *O. cellarius* (Müller), *O. alliarius* (Miller), *Retinella nitidula* (Draparnaud), *R. pura* (Alder), *Euconulus fulvus* (Müller), *Vitrea crystallina* (Müller), *Azeca goodalli* (Férussac), *Cochlicopa lubrica* (Müller),

Lauria cylindracea (da Costa), *Pupilla muscorum* (L.), *Punctum pygmaeum* (Draparnaud), *Discus rotundatus* (Müller), *Clausilia bidentata* (Ström), *Marpessa laminata* (Montagu), *Ena obscura* (Müller), *Carychium minimum* Müller, *Vitrina pellucida* (Müller), *Vallonia pulchella* (Müller).

Four slugs have been taken in the area and several *Pisidia* and *Planorbis* species are to be found in the old bed of the river at Woodhall. In 1937 a *Lymnaea peregra, monstr, sinistrorsum* (Jeff.) was taken here. *Pomatias elegans* (Müller) an operculate and snail can be found in the woods east of Collingham.

COLEOPTERA.—J. H. Flint: Sweeping should produce the best results on Linton Common and Langwith Scrubs, but Ox Close is relatively unworked. A colony of the rare *Macroplea appendiculata* is to be found in the river above Woodhall Bridge, and *Orectochilus villosus* has been found in numbers in the same spot. Where shingle beds are found, species of *Bembidion, punctulata, prasenum, decorum* and *atrocoeruleum* are sometimes plentiful. *Grynobius* (=*Priobium*) *excavatus* is to be found in old ivy stems. *Donacia simplex* var. *sanguinea* has been taken in a pond near Woodhall School.

ORNITHOLOGY.—W. A. Dewar: The woods and commons adjoining the River Wharfe from Linton to Woodhall provide a very varied and interesting list. On or before the river from Linton Bridge to Woodhall Bridge may be seen the Kingfisher, Sand-Martin, Moorhen, Common Sandpiper, Mallard, Pied Wagtail and Grey Wagtail, and possibly a Heron may be disturbed. On Linton Common the Willow Wren, Whitethroat, Lesser Whitethroat, Sedge-Warbler, Garden-Warbler, Yellow-Hammer and Skylark nest each year. The Brown Linnet is also very common here. In the larger thorn bushes the Greenfinch and Bullfinch nest along with that inveterate robber, the Magpie, which is annually increasing in numbers in this district. The Wren, Robin, Hedge-Sparrow, Blackbird, Thrush, Missel-Thrush and Ring Dove may be seen almost anywhere in the area. The Lapwing nests on the ploughed lands above the common. In the wooded country around and below Woodhall the following may be observed: Rook, Carrion Crow, Jackdaw, Kestrel Hawk, Tawny Owl, Little Owl, Barn Owl, Green Woodpecker, Greater Spotted Woodpecker, Nuthatch, Tree Creeper, Spotted Flycatcher, Great-Tit, Blue-Tit, Coal Tit and Goldfinch. Also, but rare, the Redstart.

In Ox Close, on the opposite side of the river, the Long-tailed Tit nests annually and the summer brings the welcome visit of the Grasshopper-Warbler. The Lesser Redpoll may also be seen.

In the woods at the back of Woodhall the Goldcrest may be heard if not seen. One nest was observed there two years ago.

Between the village of Linton and the railway line is a boggy field where a pair of Snipe may be found.

MEETING.—Tea will be had at headquarters, Old Star Inn, Collingham, at 5 p.m. After tea there will be a meeting for the election of new members and for the presentation of reports on the excursion by the various sections.

Next Meeting.—The next meeting will be in Ryedale, June 27th, with headquarters probably at Helmsley.

CIRCULAR No. 533

Yorkshire Naturalists' Union.

President:
E. W. MASON, M.A., M.Sc., F.L.S., Kew.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Assistant Secretary:
K. G. PAYNE, B.Sc., A.R.C.S., York.

Divisional Secretary:
K. G. PAYNE, Manor Heath, Copmanthorpe, York.

The 533rd Meeting

WILL BE HELD AT

HELMSLEY

V.C. 62

On Saturday, JUNE 27th, 1953

MEETING PLACE.—Helmsley Market-place, 11-0 a.m.

HEADQUARTERS.—The Feversham Arms Hotel, Helmsley. Tea 5-0 p.m. Afternoon Tea 2/6; High Tea (Cold Ham and Tongue with Salad Mayonnaise, Bread and Butter, Cakes, Pastry, Jam, Tea), 5/6. It is essential that all members wanting High Tea notify K. G. Payne, Manor Heath, Copmanthorpe ('phone York 6358) not later than Saturday, June 20th.

TRANSPORT.—There is now no train service to Helmsley and it is reached by 'Reliance' bus from York and by 'United' bus from Ripon, Thirsk and Scarborough.

York (Exhibition Square)	dep. 9-0 a.m.
Helmsley (Market Place)	arr. 11-0 a.m.

Returning buses leave Helmsley at 5-30 and 7-30 p.m., arriving in York 2 hours later.

Scarborough (Valley Bridge)	dep. 8-30 a.m.
Helmsley	arr. 10-35 a.m.

Returning buses leave Helmsley at 7-10 and 7-55 p.m.

Ripon	dep. 8-55 a.m.
Thirsk	dep. 9-35 a.m.
Helmsley	arr. 10-35 a.m.

The returning bus leaves Helmsley at 6-35 p.m.

York is reached from Leeds and Bradford by train or bus. A useful train is as follows:

Bradford	...	...	...	...	...	dep.	6-42 a.m.
Shipley ...	...	...	...	...	...	dep.	6-52 a.m.
Leeds ...	...	...	...	...	...	dep.	7-35 a.m.
York ...	...	...	...	...	...	arr.	8-20 a.m.

ROUTE.—Mr. Adam Gordon, Head Keeper on the Estate, has kindly offered to act as guide and he will lead those members whose studies fit in with covering the best ground from Helmsley, through Duncombe Park and about Ashberry Hill near Rievaulx. Mr. Gordon has, of course, a great knowledge of the district and also is a fine naturalist, and those members whose specialist studies prevent them covering much ground will do well to consult Mr. Gordon as to the most likely spots for their purposes.

PERMISSION.—For permission to visit this part of his estate our thanks are due to Lord Feversham.

THE DISTRICT.—Helmsley lies on the southern edge of the North-east Yorkshire moorland area and is still a very pleasant town in spite of recent red-brick buildings round the outskirts, and of popularity with those running motor-coach trips. The old town is largely stone-built and has an interesting history. It was referred to as Helmsley Blackamoor in earlier records. After the death of the second Duke of Buckingham the estate was bought in 1689 by Sir Charles Duncombe, Lord Mayor of London, by whose name the extensive and wooded park running down to the town is still known. Just inside the park gates is the castle, which is interesting both archaeologically and for its natural history. The beautiful Rievaulx Abbey lies three miles away in Ryedale, in an area of considerable botanical interest. There are fine woods both in Duncombe Park, where they include much beech, and on both sides of the river towards Rievaulx. In most places the river flows fairly fast above Helmsley. The underlying rocks of the district are, in general, limestones or calcareous grits. This shows in the vegetation mainly at the tops and bottoms of the steep valley sides. Acid soils may occur in between with a mainly heathy vegetation.

PREVIOUS MEETING.—A report by Dr. W. H. Pearsall and the late Mr. F. A. Mason on the Union's meeting at Helmsley May 19th-21st, 1923, occupies pp. 246-255 of *The Naturalist* for 1923 and should be consulted. This meeting was attended by about 40 members and was considered to have been outstandingly successful. Besides shorter notes on other subjects this report contains the following:

An account of the plant ecology of the area, by Dr. Pearsall;

Notes and lists of fungi covering more than two pages by the late Mr. F. A. Mason;

A list of 73 species of lichens by the late Mr. W. E. L. Wattam;

Lists of molluscs from various localities by the late Mr. Greevz Fysher;

A list of 88 species of Diptera, of which eight were new to Yorkshire and 67 new to V.C.62, by Mr. Cheetham.

VERTEBRATES.—The following information is contributed by Mr. E. W. Taylor, C.B.E., F.R.S., M.B.O.U.:

The Helmsley area has long been known as particularly rich in wild animal life and, so far, a considerable felling of timber in Duncombe Park and other changes associated with recent years have produced no major changes in the fauna. This rich fauna probably is related to the large variety of trees and to the amount of old timber present and could rapidly be affected by replacement by only the Forestry Commission type of planting.

Both the Red and Fallow Deer are still present though not now enclosed and in much smaller numbers than at the time of the 1923 meeting. Badgers are fairly common and not infrequently are killed by cars on the roads at night. The foot-

prints of others can often be seen by the river. The Red Squirrel appears completely to have disappeared, as over so much of the country; the Grey Squirrel, of course, is plentiful. Of the bats, Pipistrelle, Daubenton's, Noctule, Long-Eared, Lesser Horseshoe, Barbastelle and Whiskered, are recorded for Helmsley. Of these, however, Mr. Gordon has not recently been able to find the Whiskered Bat, the supposedly rare Barbastelle being much easier to locate.

Of the birds Mr. H. B. Booth wrote in 1923 that about 70 species were noted at the Helmsley Meeting. ' Pairs of Pied Flycatchers were seen by the score and pairs of Nuthatches almost by the dozen; in fact, it is doubtful if there is any other place in Yorkshire where these two charming species occur in such numbers.' These two species maintain their numbers, and, in addition, the Lesser Spotted Woodpecker has been seen in each recent year. Two pairs of Grasshopper Warblers were present in 1952 and two pairs of Corncrakes. The Nightjar is getting rarer, but also has been seen all or most recent years. The Sandpiper, Dipper, and Grey Wagtail are on the river each summer and a pair of Oystercatchers were there last year, but Kingfishers are mainly below Helmsley. Tree Creeper and Redstart are plentiful and the old town of Helmsley itself has a notable Swift population. On the other hand, the Long-Eared Owl has not been seen recently and proof is yet needed of the presence of the Willow Tit and of the Lesser Whitethroat. On the higher ground the Ring Ouzel, Curlew, Golden Plover and Merlin are to be found. Snipe, Woodcock, Mallard, Tawny and Little Owls, Wood and Garden Warblers, Blackcap, Chiffchaff and Goldcrest are among the other species to be seen.

Finally, regarding the reptiles and amphibians, Adders are fairly common. Six or more Slow Worms recently were caught by a boy on the Castle Moats. The Natterjack Toad has been twice recorded, but efforts to find it recently have not been successful. Mr. Gordon has found the Palmate and Smooth Newts.

ENTOMOLOGY.—The work so far done in the district is quite inadequate. The following Coleoptera were mentioned by Mr. M. L. Thompson in his report at the 1923 meeting: *Tachyusa leucopus* Marsh., *Philonthus rubripennis* Stephens (both in wet shingle on the banks of the Rye), *Catops kirbii* Spence, *Epuraea melanocephala* Marsh., *Phyllotreta atra* F. and *Ceuthorrynchus asperifoliarium* Gyll. *Clytra quadripunctata* L. was found in some number about nests of *Formica rufa* L. in Riccal Dale.

Twenty-two further species of Coleoptera were recorded by the late Mr. J. M. Brown following a visit in September, 1935. These included *Platycis minuta* F., which occurred in most of the woods visited, and *Endomychus coccineus* L. which was taken under bark.

For this list of beetles, together with Mr. Brown's notes on Hemiptera, Neuroptera, Psocoptera, Collembola and the aquatic orders, see *The Naturalist*, 1935, pp. 259-260.

As mentioned above, Mr. Cheetham listed 88 species of Diptera taken at the 1923 meeting.

FRESHWATER BIOLOGY.—H. Whitehead, B.Sc.: The only records from the Helmsley district are those given by J. M. Brown in *The Naturalist*, 1935, p. 260. His visit was in September, but of those listed the following may be seen in June. Many of the specimens were taken in Riccal Dale.

Ephemeroptera (Mayflies)

Habrophlebia fusca (Curt.), *Centroptilum luteolum* (Müll.).

Plecoptera (Stoneflies)

Perla cephalotes Curt., *Leuctra fusca* L.

Trichoptera (Caddisflies)

Limnophilus auricula Curt., *Stenophylax stellatus* Curt., *S. vibex* Curt., *Lepidostoma hirtum* Fab., *Lasiocephala basalis* Kol., *Mystacides azurea* L., *Psychomyia pusilla* Fab., *Wormaldia* sp., *Glossosoma vernale* Pict., *Rhyacophila obliterata* McLach.

There is no reference to other species of aquatic invertebrates and records and observations will be welcomed.

FLOWERING PLANTS.—Miss C. M. Rob, F.L.S.: The district around Helmsley and Rievaulx is so well known as a botanists' paradise that it is unlikely any new records will be made—the ground has been worked by many well-known people in the past. The list of plants is very long. Some of the most interesting include: *Actaea spicata* L., *Trollius europaeus* L., *Helleborus viridis* L., *Aquilegia vulgaris* L., *Papaver lecoqii* Lamotte., *Hypericum montanum* L., *Ribes alpinum* L., *Salix nigricans* Sm., *Primula farinosa* L., *Symphytum orientale* L., *Cuscuta epithymum* (L.) Murr., *Verbascum nigrum* L., *Galeopsis ladanum* L., *Cirsium acaule* (L.) Scop., *Epipactis palustris* (L.) Crantz., *Ophrys apifera* L., *O. insectifera* L., *Carex lepidocarpa* Tausch. and *Hordelymus europaeus* (L.) Harz.

On the terrace at Rievaulx are several naturalised aliens, including *Lilium martagon* L. and *Lonicera xylosteum* L. *Saxifraga cymbalaria* L. has been found in the wooded bank below the Temple. *Tilia cordata* Mill. is in one of the gills between Duncombe Park and Wass Moor, and is thought to be native here.

In addition to the plants listed the show of *Myosotis sylvatica* Ehrh. and *Convallaria majalis* L. are particularly fine in the woods at Ashberry. *Paris quadrifolia* L. is in a number of woods throughout the district and *Cypripedium calceolus* L. has been recorded, but not for many years.

FUNGI.—The district has been well worked by the Mycological Committee of the Y.N.U. and reference should be made to *The Naturalist*, 1903, p. 425; 1919, p. 396; 1920, p. 397; and 1923, p.247.

MEETING.—Tea at headquarters, The Feversham Arms, Helmsley, at 5-0 p.m. This will be followed by a meeting for the election of new members and to receive reports from the various sections on the day's work.

Next Meeting.—North Cave, V.C.61, July 11th, 1953.

CIRCULAR No. 534

Yorkshire Naturalists' Union.

President:
E. W. MASON, M.A., M.Sc., F.L.S., Kew.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Assistant Secretary:
K. G. PAYNE, B.Sc., A.R.C.S., York.

Divisional Secretary:
Miss F. E. CRACKLES, 143 Holmgarth Drive, Bellfield Avenue, Hull.

The 534th Meeting

WILL BE HELD AT

NORTH CAVE

(V.C. 61)

On SATURDAY, JULY 11th, 1953

HEADQUARTERS.—The White Hart, North Cave. Proprietress: Mrs. Rixham. Cold meat and salad tea, 3/9; Ham and salad tea, 4/3. A postcard ordering tea should be sent to Mrs. Rixham giving a fortnight's notice.

ACCOMMODATION.—Limited accommodation at the White Hart. Bed and Breakfast, 9/6. Re other possibilities write to the Divisional Secretary.

TRANSPORT.—North Cave is best served by bus (E.Y.M.S.):

Hull	dep.	8-55 a.m.	9-55 a.m.
North Cave (Memorial)	arr.	9-57 a.m.	10-57 a.m.
Goole	dep.		9-55 a.m.
North Cave (Memorial)	arr.		10-41 a.m.
Selby	dep.		8-30 a.m.
North Cave (Memorial)	arr.		9-41 a.m.

RETURN—

North Cave (Memorial)	dep.	5-41 p.m.	6-41 p.m.
Hull	arr.	6-48 p.m.	7-48 p.m.
North Cave (Memorial)	dep.	4-57 p.m.	6-55 p.m.
Goole	arr.	5-45 p.m.	7-30 p.m.
North Cave (Memorial)	dep.	5-57 p.m.	7-57 p.m.
Selby	arr.	7-8 p.m.	9-08 p.m.

There is no regular bus service from Market Weighton. Any members wishing to travel on Saturday morning by train from York should write to the Divisional Secretary re possibilities of transport from Market Weighton.

MEETING PLACE.—North Cave Memorial at 11 a.m.

MAP.—One-inch Ordnance Survey, New Popular Edition, Sheet 98.

PERMISSION to investigate territory on their estates has kindly been given by the Houghton Estates Company (Viscountess FitzAlan of Derwent). Permission to visit part of the Hotham Hall Estates is also being sought from the Bostonian Land Co. (Col. T. C. Clitherow, D.S.O.).

Members are reminded that *no dogs* may be brought on to the ground to be visited and are requested to be particularly careful not to leave gates open.

ROUTE.—It is proposed to proceed from North Cave to Dryham by footpath, then on to Snake Hall and Duck nest areas. If there are enough cars in the party it may be desirable to proceed from North Cave direct to Snake Hall. Mr. E. B. Burstall, who knows the area well, has kindly agreed to lead the Ornithologists. (It is suggested that those arriving well before the official meeting time may care to explore the sandy lane to Dryham.)

THE DISTRICT.—The area to be visited is a tract of sandy alluvium to the north-west of North Cave which is at the western edge of the chalk wolds. Details concerning the geology of the area may be found in the following books: *The Geology of the Country between York and Hull*, Mem. Geol. Survey; *Geological Rambles in E. Yorks.*, Sheppard; *Geology of Yorks.*, Kendall and Wroot; *Glacial Geology of Holderness and Vale of York*, Melmore.

FLOWERING PLANTS.—F. E. Crackles: The lanes, fields, pits and woods of the area provide a happy hunting ground for the student of flowering plant distribution.

Species occurring here which are only found in the sandy areas of the Vice-County include *Corydalis claviculata* (L.) D.C. in shady places, *Ornithopus perpusillus* L. and *Plantago coronopus* L. Xeraphilous plants characteristic of the area but also found on the gravels of Holderness are *Erophila verna* (L.) Chevall., *Anabidopsis thaliana* (L.) Heynh., *Anthriscus neglecta* Boiss & Reut and *Marrubrium vulgare* L. *Hypericum humifusum* L. and *Scleranthus annuus* L. are also found mainly on such sandy areas but sparingly elsewhere in the Riding, while *Cerastium arvense* L. is a dry-loving species occurring here and on the chalk wolds.

Plants characteristic of disturbed ground in the area include such arenipholous species as *Spergula arvensis* L., *Erodium cicutarium* L., and *Lycopsis arvensis* L., which are all common and *Spergularia rubra* (L.) J. & C., which occurs sparingly. *Echium vulgare* L. occurs occasionally and cornfield weeds found commonly here include *Chrysanthemum segetum* L. and *Centaurea cyanus* L. I once recorded *Lychnis githago* L. near Dryham.

Other species of note which I have found in the area are: *Geranium pyrenaicum* Burm., *Sanguisorba officinalis* L., *Saxifraga granulata* L. and *Lysimachia vulgaris* L. *Ornithogalum umbellatum* grows in a lane at Dryham, having possibly escaped from a cottage garden.

Near Snake Hall Farm is a piece of heather moor with adjacent marshy ground which may well repay investigation.

ENTOMOLOGY.—The area does not seem to have been well worked.

LEPIDOPTERA.—D. Wade: Species recorded for Hotham Carrs include:

(i) *Butterflies*.—Large White, Small White, Green-Veined White, Orange Tip, Meadow Brown, Gatekeeper, Wall Brown, Ringlet, Common Blue, Small Copper, Dingy Skipper.

(ii) *Moths*.—Fox Moth, Beautiful Yellow Underwing, Poplar Hawk Moth, Elephant Hawk Moth, Eyed Hawk Moth.

Other species recorded for the nearby Houghton Wood area which may be expected to occur in the area to be visited are: Large Skipper, Small Skipper, Grizzled Skipper, Red Admiral, Painted Lady, Small Tortoiseshell, Peacock, Coxcomb Prominent, Pepple Prominent, Iron Prominent, Pale Tussocks, Common Vapourer, Pine Beauty, Peppered Moth, Common Forester, Dunbar, Archer's Dart, Common Wave, Cinnabar Moth.

COLEOPTERA.—See T. Stainforth's notes for the Houghton Wood area, Circular No. 447, and the report of this excursion in *The Naturalist*, 1943.

ORNITHOLOGY.—E. B. Burstall: This is, of course, the worst possible time of the year for ornithologists, which is a pity as the area proposed to be visited supports a varied and interesting avine population.

The soil is lime free and the area comprises carr land and heather with woods and spinneys consisting principally of birch, oak and conifers. Curlew, Snipe, Redshank and Mallard are regular breeders in the vicinity of Duck nest and Market Weighton Canal and the woods support a few Nightjars and several resident Woodcocks, in addition to Green and Greater-Spotted Woodpecker, Jays and Long-tailed Tits.

Other birds noted in the vicinity in recent summers are Pied Flycatcher, Grasshopper Warbler, Wood-Warbler, Redstart, Lesser-Spotted Woodpecker, Long-eared Owl, Teal, Water-Rail and Quail.

Altogether some 70 to 80 different species may reasonably be looked for, including (in addition to those species already mentioned) Carrion Crow, Magpie, Goldfinch, Redpoll, Bullfinch, Corn-Bunting, Reed-Bunting, Tree-Sparrow, Tree-Pipit, Meadow-Pipit, Yellow Wagtail, Coal-Tit, Marsh-Tit, Goldcrest, Sedge-Warbler, Wheatear, Kingfisher, Little Owl, Sparrow-Hawk, and Red-legged Partridge.

P.S. Botanical members are asked to look for any Juniper plants in the locality as Juniper is not recorded from V.C.61.—C.A.C.

MEETING to elect new members and to receive reports of the day's findings will follow tea at 5 p.m. at the White Hart.

The next meeting will be at Bretton, V.C. 63, July 25th, 1953.

Circular No. 535

Yorkshire Naturalists' Union.

President:
E. W. MASON, M.A., M.Sc., F.L.S., Kew.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Assistant Secretary:
K. G. PAYNE, B.Sc., A.R.C.S., York.

Divisional Secretary:
Miss J. GRAINGER, Wilshaw, Meltham, Huddersfield,
with the assistance of
Mr. R. S. ATKINSON, F.R.A.S., 46 White Hill Avenue, Barnsley,
with members of Barnsley Naturalists' Society, are responsible for the Nature Notes in the Circular.

The 535th Meeting

WILL BE HELD AT

BRETTON AND CAWTHORNE

On SATURDAY, JULY 25th, 1953

HEADQUARTERS.—The Spencer Arms, Cawthorne. Plain Tea 2/6; Meat Tea 4/6 to 5/-. Would members requiring tea please write to the Proprietor, Spencer Arms, not later than July 19th, stating which tea they wish to order.

MEETING PLACE.—The morning will be spent in Bretton Hall Park by kind permission of the W.R. Education Committee. Members should meet in Bretton Village at 11-0 a.m. near the main entrance to Bretton Hall.

The afternoon is to be spent in Deffer Wood by kind permission of Lady Stanhope, per Major Pardoe. People in cars are advised to return to Bretton, collect car, and proceed to Cawthorne for Deffer Wood. People on foot: there is a footpath through Bretton Park which comes out into Litherop Lane a little below High Hoyland Church. Continue to walk along to the village, and through it on towards Cawthorne. On the left-hand side of the road one comes to a cottage. Directly opposite this, on the right-hand side is a gate and footpath which enters Deffer Wood. This is perhaps a mile beyond High Hoyland village so that it is rather a long walk and not conducive to lingering and observing or collecting.

MAPS.—44/20 and 44/21 2½ inch to mile, Ordnance Survey, New Series.
1 inch, No. 102.
Geological: 1 inch Geological Survey, Sheet 87, New Series.

TRANSPORT.—Bretton is served by the Dewsbury-Bradford, Wakefield-Barnsley buses, and Huddersfield to Barnsley *via* Bretton.

There are return buses from Cawthorne to Huddersfield and Cawthorne to Barnsley.

Buses for July 25th to Bretton (West) Village—

From Wakefield: 10 minutes to the hour.

From Dewsbury: 20 minutes past each hour (connected also with Bradford, leaving Bradford 50 minutes previous, i.e. half-past each hour).

From Huddersfield: *Via* Kirkburton, 20 minutes past the hour.
Via Flockton (a rather shorter route), half-past each hour.

From Barnsley: 20 minutes past each hour.

Meet at War Memorial in Bretton Village (near bus stop) at 11-0 a.m. approximately (when the relative buses have arrived).

VERTEBRATE ZOOLOGY.—C. Jukes: Perhaps the most interesting mammal of the area is the Fallow Deer, a small herd of which were seen in February in Margery Wood. Here many young trees has been stripped of their bark from two to four feet from the ground. These deer are the descendants of the Cannon Hall Park herd of many years ago.

The Red Squirrel occurs in Deffer Wood and at Bretton where on hot afternoons they can be found resting in nests of the Wood Pigeon. Other common mammals are the Fox, Rabbit, Brown Hare, Field Mouse, Bank Vole, Hedgehog, Stoat and Weasel. Less common are the Water Vole, Water Shrew and Pigmy Shrew.

ORNITHOLOGY.—C. V. Horrocks: This is an area of woodland, parkland and small lakes which attracts many resident and migrant birds. In addition to the common species the following have bred at Bretton: Mute Swan, Moorhen, Coot, Great Crested Grebe, Little Grebe, and Canada Goose. The list of less common and rare birds which have been seen and recorded over the past few years by observers in the Bretton area includes Tree Creeper, Nuthatch, Long-tailed Tit, Lesser Whitethroat, Green Woodpecker, White-breasted Barn Owl, Sparrow Hawk, Heron, Dark-breasted Brent Goose, Gadwall, Shag and Corncrake. Large colonies of Wood-Pigeons occur in Deffer Wood.

BOTANY.—W. R. Barker, F.G.S.: The general features of this area are somewhat rugged in character, the land being much undulated, with streams running through small valleys. It is a well-wooded region having a typical coal measure flora with a light admixture of introduced plants, now well established.

The stream known as Cawthorne Dike feeds the lake in Cannon Hall Park, where the botanists may profitably examine the lake flora. The plants likely to be met with in flower include *Nuphar lutea, Alisma plantago, Polgonum hydropiper, Ranunculus sceleratus, Scutellaria galericulata, Sparganium ramosum, Mimulus luteus, Potamogeton pectinatus, P. densus.* In the Park may be seen Oak, Beech, Scots Pine and Walnut, but these were mostly planted many years ago.

Deffer Wood is a mixture of original woodland trees, such as Oak and Birch, and others which have been specially planted. These include Holm Oak, English Yew, a species of Pine and Snowberry. Guelder Rose, Honeysuckle and Ling also occur in this wood, but there is nothing outstanding in the flowering plants, except perhaps *Corydalis claviculata.* The wood is rich in fungi though it will be too early in the year to see these.

On the outskirts of the woods *Melampyrum pratense* may be found, and in the fields and their margins *Agrimonia eupatoria, Ciborium intibus* and *Hypericum perforatum* occur with many other more common plants. On high ground *Polygala vulgaris, Euphrasia officinalis* and *Erythraea centaurium* might be seen in flower. On waste ground relics of a past industry (that of dyeing) are represented by *Genista tinctoria* and *Reseda lutea.* Here we also find occasionally *Symphytum officinale, Ballota nigra, Malva sylvestris, Eshium vulgara* and *Anchusa officinalis.*

Cawthorne Park and Bretton Park are very similar to Deffer Wood in their flora. The stream which flows into Bretton Lake eventually joins up with the Cawthorne Dike and together they merge into the River Dearne.

COLEOPTERA.—E. G. Bayford, F.R.E.S.: The Entomologist has a choice of places any one of which should satisfy him. He would do well to concentrate on one and it may be said with safety that Bretton Park presents the greatest possibilities. As the River Dearne flows through and has been widened in two places to form lakes the *riparian* genera *Elaphrus, Agonum* and *Bembidion* should be well represented, and patient search will discover other *Geodophagous* species. *Cychrus rostratus* was seen in 1951. *Heterocarus* is worth looking for, the nearest record for this genus is some miles to the east. Lower down the river *Donacia versicolorea* Brahm. was met with in 1890 and other species of this genus should occur. *Librodor* and *Glischrochilus* are on record from the near neighbourhood and *Orchesia undulata* has been met with in numbers, but this was when hibernating. Amongst the ladybirds, *A. obliterata, A. bipunctata, A. 10-punctata, C. 7-punctata, P. 14-punctata* were noted in 1951 and from the adjoining area *Halysia, Anatis* and *Neomysia* and *Coccidula* have been recorded and also the uncommon *Metoecus paradoxus* has been taken.

NEUROPTERA.—*Chrysopa, Panorpa, Raphidia,* and *Sialis* and several species of Dragonflies should be seen.

DIPTERA.—The only definite record is one of *Ornithomyia avicularia* from Kexbro'.

ISOPADA.—In 1951 several specimens of *Trichoniscus pusillus* Brandt. were found.

LEPIDOPTERA.—J. H. Seago: The Cawthorne-Bretton district is not especially rich in butterflies, only twenty species having been noted. The most common and widely-distributed butterflies are *Maniola jurtina, Aglais urticae, Pieris brassicae, P. rapae,* and *P. rapi.*

Pararge megera, Coenonympha pamphilus, Polyommatus icarus and *Lycaena phlaes* have a tendency to form colonies but these are widely scattered and the butterflies usually appear in good numbers. Two fritillaries occur, *Argynnis aglaia* and *A. paphia,* two colonies of the former being in the Cawthorne district, whilst the latter occurs very rarely at Bretton.

Celastrina argiolus and *Polygonia c-album* both occur in Deffer Wood, *Ochlodes venata,* formerly rare in the district is now locally common at Bretton and Cawthorne. *Callophrys rubi* also appears to be extending its range in the district, and a late specimen or two might be seen. *Thymelicus sylvestris* occurred near Cawthorne until four years ago but is now apparently extinct. *Nymphalis io* has also recently undergone a sudden reduction in numbers.

The moths recorded for the district are far too numerous to list in full but the following are of special interest since they appear to be absent in neighbouring districts.

Small Elephant, *Chaerocampa porcellus.* Cawthorne.
Ruby Tiger, *Phragmatobia fuliginosa.* Coxley.
Wood Tiger, *Parasenia plantaginis.* Near Cawthorne.
Marbled Coronet, *Dianthoecia conspersa.* Cawthorne.
Gold Spot, *Plusia festucae.* Cawthorne.
Common Forester, *Ino Statices.* Woolley and Gunthwaite.

The district is noted for its melanic forms, the more conspicuous of which are listed.

Grey Arches, *Aplecta nebulosa* var. *robsoni* Collins.
Green Brindled Crescent, *Miselia oxyacanthae* var. *capucina* Mill.
Clouded-bordered Brindle, *Xylophaisa rurea* var. *combusta* Haworth.
Dark Arches, *Xmonoglypha* var. *infuscata* White.
Wood Tiger, *Parasemia plantaginis.* Occasionally specimens are found whose forewings are almost black. Such specimens invariably have red stripes on their abdomen in place of the usual yellow ones.
Mottled Beauty, *Boarmia repandata* var. *nigricata* Fuchs.
Willow Beauty, *B. gemmaria* var. *rhomboidaria.*
Welsh Wave, *Venusia cambica* var. *bradyi.*
Grey Pine Carpet, *Thera variata* var. *obliterata* White.
Water Carpet, *Lampropteryx suffumata* var. *piceata* Stephens.
Mottled Grey, *Malenydris multistrigaria* var. *nubilata* Tutt.
Scalloped Hazel, *Gonodontis bidentata* var. *nigra* Prout.
Peppered Moth, *Pachys betularia* var. *doubledayaria* Milliere.

Northern Spinach, *Lygris populata*. Dark ground colour.
Chevron, *L. testata*. Dark ground colour.
July Highflyer, *Hydriomera furcata* var. *infuscata* Staud.
Clouded Magpie, *Abraxas sylvata*. Leaden coloured specimens occasionally occur.
Magpie, *A. grossulariata*. Specimens on the whole rather darker than the type. *A. b Varleyata* has not been found in the district for 40 years.
November Moth, *Oporabia diluta* var. *melana* Prout and various intermediates between this form and type.
March Moth, *Anisopteryx aescularia*. Blackish specimens of regular occurrence.
Mottled Umber, *Hybernia defoliaria*. Unicolorous forms occur regularly.

GEOLOGY.—W. R. Barker, F.G.S.: The Silkstone Coal which forms the base of the Middle Coal Measures crops out at Bilham Grange and Deffer Wood, to the lake in Cannon Hall Park, where only one seam has been worked. In Tivy-Dale this coal is split up into two seams which are separated by as much as 25 feet of shale. The working of this coal in the Cawthorne area has now ceased and the only coal now being worked is from a small dayhole between Cawthorne and Silkstone and is known as the Silkstone Four-Foot.

In Deffer Wood the Silkstone Rock lies almost immediately above the Silkstone Coal and the massive, even-bedded sandstone has been much quarried for building stone on the dip-slope between Banks Hall and Tivy-Dale.

The Silkstone Four-Foot Coal which occurs a little distance above the Silkstone Rock has been outcropped to the north-west of Bilham Grange, and at Bilham Shrogg, and the roof shales in the old crop workings yielded the non-marine shells, *Carbonicola communis*, *C. pseudorobusta*, *C. subconstricta*, and the ostracod *Geisina arcuata*. This seam has also been worked in an old adit in Deffer Wood, where the roof contained the shells of *Carbonicola* sp.

Higher in the coal strata we get the Swilley Coal, which crops out on the southern slopes of the Dearne Valley to the south of Bilham Grange. The roof of this coal contains a rich assemblage of species belonging to the genera *Carbonicola*, *Anthracosphaerium*, and *Naiadites*. The strata dealt with form the base of the *Communis* zone. In the base of the *Modiolaris* zone the Thorncliffe Thin Coal and the Parkgate Coal have been found in a borehole at the southern end of Cawthorne Park.

In the valley near Banks Hall an ice-borne boulder of igneous rock about 2 feet 6 inches across was found many years ago and is now preserved outside the Cawthorne Museum which also contains collections of local fossil plants and shells.

P.S. As Yew is cited amongst the plants it may be well to see if possibly Juniper has been overlooked, it is not recorded for V.C. 63.—C.A.C.

MEETING.—A meeting will be held at Headquarters, Cawthorne, for the election of new members and to hear reports from the various sections on the day's meeting. This will follow a tea at 6-0 p.m.

CIRCULAR No. 536

Yorkshire Naturalists' Union.

President:
E. W. MASON, M.A., M.Sc., F.L.S., Kew.

The Autumn Fungus Foray

WILL BE HELD AT

SANDSEND

SEPTEMBER, 25th to 29th, 1953

Chairman: Coun. F. C. RIMMINGTON, Scarborough.
Recorders: Mr. W. G. BRAMLEY, Pickering.
Dr. J. GRAINGER, Auchineniure.

Secretary: Miss J. GRAINGER, Wilshaw, Meltham, Huddersfield.

HEADQUARTERS.—The Bungalow Hotel, Sandsend. Terms: 21/- per day. Members should write direct to Capt. A. L. Clarke, Bungalow Hotel, Sandsend.

EXCURSIONS.—The collecting ground is mainly Mulgrave Woods for which permission is already obtained. If desired, an excursion to Grinkle Park may be arranged.

CHAIRMAN'S ADDRESS.—"The Genus Penicillium" will precede the Annual Meeting at approximately 7-45 p.m.

THE ANNUAL MEETING will follow at approximately 8-45 p.m.

WORKROOM.—There are adequate facilities at the Bungalow Hotel. Members should bring microscopes and books.

MAP.—Sheet 86, one-inch Ordnance Survey.

CIRCULAR No. 537

Yorkshire Naturalists' Union.

President:
E. W. MASON, M.A., M.Sc., F.L.S., Kew.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Assistant Secretary:
K. G. PAYNE, B.Sc., A.R.C.S., York.

Hon. Treasurer:
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

Sectional Meetings, 1953

to consider the Annual Reports and nominate Officers for the Sections and their Committees.

All members and associates of the Union are eligible to attend.

OCTOBER 3rd.—Leeds Church Institute, Committee Room. The **Geological Section** meet at 2-0 p.m. The **Freshwater Biological Section** at 3-0 p.m. The **Conchological Section** meet at the Geological Department, Leeds University, on October 10th, at 2-30 p.m.

OCTOBER 10th.—**The Botanical Section** will meet in the Botanical Department, Leeds University, at 2-30 p.m. Entrance *via* Baines door, University Road.

After tea there will be an exhibition of specimens to which members are invited to contribute.

OCTOBER 17th.—**Vertebrate Section.** Meetings will be held in the **Belgrave Rooms, New Briggate, Leeds 1,** on SATURDAY, 17th OCTOBER, 1953, at 3-0 p.m. and 6-0 p.m.

Members and associates are cordially invited to attend the above

meetings. Will officials of affiliated societies kindly notify their members.

There will be a break for tea from about 4-45 to about 5-45 p.m. at which time the evening session will commence. Arrangements will be made to provide tea for those members who care to bring sandwiches.

October 24th.—**Entomological Section.** The Annual Meeting of the section will be held in the **Leeds City Museum, Park Row,** where a room has been made available by courtesy of the Leeds Literary and Philosophical Society. Meet 2-30 p.m. Tea will be available at a small charge. Please bring own food.

Business.—Exhibits, Recorders' Reports, Nomination of Officers, Excursions, Spring Meeting, Any Other Business.

Please Bring Exhibits.

W. A. Hincks,

(*Hon. Sect. Secretary*).

November 7th.—An **Executive Meeting** will be held at 3-0 p.m. in the Committee Room on the first floor of the Parkinson Building. The entrance is *via* the main entry to the University in Woodhouse Lane.

December 5th.—**The Annual Meeting** will be held in Halifax by the kind invitation of the Halifax Scientific Society.

CIRCULAR No. 538

Yorkshire Naturalists' Union.

President:
E. W. MASON, M.A., M.Sc., F.L.S., Kew.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Assistant Secretary:
K. G. PAYNE, B.Sc., A.R.C.S., York.

Hon. Treasurer:
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

The 92nd ANNUAL MEETING

WILL BE HELD IN THE

SPRING HALL

HALIFAX

On Saturday, DECEMBER 5th, 1953

The 539th Meeting and the 92nd Annual Meeting will be held at Spring Hall, Halifax, by the kind invitation of the Halifax Scientific Society, President J. H. Lumb.

The Presidential Address will be delivered by F. W. Mason, M.A., M.Sc., F.L.S., the title of the address being, 'Literature, Science and the Naturalist.'

Spring Hall is situated on the East Side of the main Halifax—Huddersfield Road, half a mile from the centre of the town. There are ample parking facilities for cars in the grounds. Frequent bus services from town pass the Hall. Nos. 51, 51a, 51b, 55a, 54a, 43, 54, 55, 56, 51 from outside Electric Picture House.

All meals and conveniences are available on the premises and there will be no need to leave the Hall.

Cold Lunch may be obtained from 2/6—3/6 per head approx. Orders for lunch must be sent direct to the Secretary, Halifax Scientific Society, 4 Leafland Street, Gibbet Street, Halifax, not later than November 28th, 1953.

Afternoon Tea will be provided by the Society.

It is hoped that Roy Watling will have a display of Mycological material.

The Mayor and Mayoress, Councillor Harold Pickles, J.P., and Mrs. Pickles will give a Civic welcome to the Union at 2-30 p.m.

Programme:

Executive Meeting	11-30 a.m.
General Committee	12 noon.

Members are reminded that the General Committee comprises all members of the Union together with the Delegates of Affiliated Societies

Lunch .... 1-0 p.m.

Annual Meeting, 2-30 p.m. prompt, will be opened by the Mayor of Halifax, Harold Pickles, J.P., welcoming the Union to Halifax and the President of the Union will then deliver his Presidential Address on, ' Literature, Science and the Naturalist.'

If accommodation is required it can be had at:

Maudes Temperance Hotel, Broad Street
or White Swan Hotel, Trust House, Princes Street.

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All communications to be addressed to—

The Editor, Dept. of Botany, Queen's University, Belfast.

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W. A. SLEDGE, Ph.D., B.Sc.,

THE UNIVERSITY, LEEDS,

with the assistance as referees in special departments of

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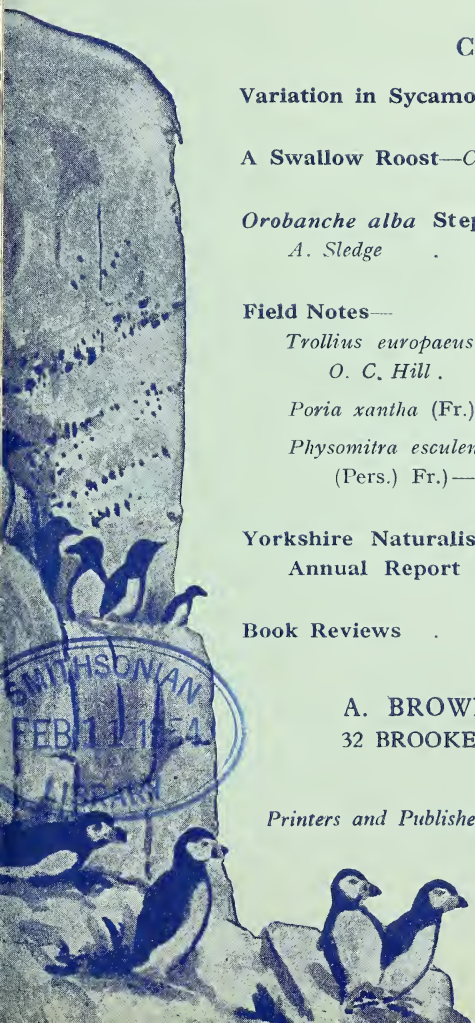

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THE NATURALIST

FOR 1954

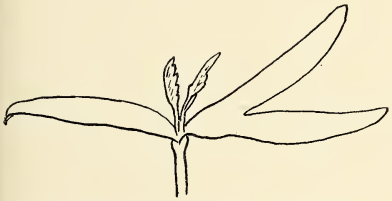
VARIATION IN SYCAMORE SEEDLINGS

JOAN E. BARTLE

My attention was first drawn to Sycamore seedlings differing from the normal type with two single cotyledons, by a paper by Mr. John Parkin (1940), who found that out of 63 seedlings with three cotyledons 11 had their first foliage leaves in whorls of three.

For the past six years I have found abnormal seedlings, their frequency varying from year to year. Although I have made no attempt to compare exactly the proportion of these to the normal, it seemed that the abnormal ones were more plentiful in 1947 and 1951.

Closer examination of the various seedlings found revealed that there are several types. In specimens with three cotyledons it appears that either one cotyledon has been split, or that the embryo apex had at first three distinct cotyledon primordia, two of which became joined together at some stage of their growth. In cases where there was this splitting or joining, the seedlings had only two foliage leaves at the first epicotyl node. Where the three cotyledons were entirely separate, except in one with very slight joining at the base, there was a whorl of three first foliage



SHOOT OF DECUSSATE SEEDLING WITH ONE SPLIT COTYLEDON. TYPE B.

SHOOT OF TRICUSSATE SEEDLING TYPE D.

leaves. Those with three cotyledons and three first foliage leaves are here termed tricussate.

Thus, the seedlings examined may be classified as follows:

A. Normal decussate seedlings.
B. Decussate seedlings with one cotyledon split, but not to base (12).
C. Seedlings with three cotyledons, two of them joined at the base, and a pair of leaves at the first epicotyl node (7).
D. Tricussate seedlings, that is, with three cotyledons and three leaves at the first epicotyl node (20).
E. Tricussate seedlings with one cotyledon split (1).
F. Seedlings with four cotyledons, or two split ones, and two first leaves (7).
G. Seedlings with four cotyledons and three first leaves (1).
H. Seedlings with four cotyledons and four first leaves (1).

The numbers in brackets denote the numbers of seedlings of each type examined.

To investigate whether the number of the xylem poles in the root bore any relation to the cotyledon and leaf arrangement, transverse sections of the root were cut. It was found that normal seedlings had four root poles, type B four or five, type C five, and type D five or six. This result seems to suggest that the tricussate seedlings start with an apex producing whorls of three leaf primordia, and do not become tricussate by the splitting of one of the cotyledons already formed from two primordia.

From time to time I have allowed tricussate seedlings to grow up into saplings, but sooner or later, with one exception, their main shoots have reverted from the tricussate type to the normal decussate arrangement. One second year tree grown in a plant pot made the change during our holiday when it received copious waterings in a friend's greenhouse.

In all cases after the change to decussate arrangement the internodes were noticeably longer. The exception mentioned is now in its fourth year and growing vigorously, still tricussate.

The reverse change from decussate to tricussate arrangement is known to occur in vigorous shoots of sycamore, horse chestnut (Bartle, 1946) and privet.

Type of seedling	Number examined	Cotyledons	Foliage leaves at first epicotyl node	Root poles
A	(normal)	2	2	4
B	12	1 and 1 split	2	4 or 5
C	7	1 and 2 joined at base	2	5
D	20	3	3	5 or 6
E	1	2 and 1 split	3	
F	7	4 or 2 split	2	
G	1	4	3	4
H	1	4	4	

Bartle, Joan E. (1946). An Abnormal Horse Chestnut Twig, *North Western Naturalist*, March and June, 1946.

Parkin, John (1940). Variation in the Cotyledons of the Sycamore, *North Western Naturalist* December 1940, 261-262.

A SWALLOW ROOST

C. D. ROBINSON

On August 11th, 1953, some 300-400 Swallows (*Hirundo rustica*) were seen flying over marshes near Keighley at 8-50 p.m. A few were feeding on nearby pools, but the majority flew backwards and forwards at a height of 20-30 feet over a bed of Great Reed-Mace (*Typha latifolia*). Single birds kept leaving the main congregation and dropping quickly into the bed, until by 9-10 p.m. all birds were settled.

At the next visit on August 25th, I was able to watch the movements of the birds before roosting began. Numbers had now increased considerably to *c.* 800-900 birds. Many were assembling on nearby wires at 8 p.m. and at 8-5 p.m. they all left, flying low over pools, until the main concentration was seen to be in the vicinity of the roost. Small parties were continually arriving to swell the flock, by way of the Aire Valley, and also quite a number came over higher ground from the direction of Long Lee and Harden. By 8-15 p.m. most of them had settled on the dead spiky inflorescence and top-most leaves of the Reed-Mace, later flying down on to lower leaves; and with much fluttering the birds sidled up towards the stems of the plants until their perches were more secure. Roughly there would be about six birds on a leaf, this of course depended upon the strength of the leaf, some only holding one or two birds. At this stage small parties would for no apparent reason, suddenly disperse and join the birds flying overhead. A large sudden dispersal occurred at 8-32 p.m. after nearly all had settled, again for no apparent reason, making an impressive flight for a few minutes with birds rocketing swiftly down until again all were at rest. Following this, odd birds were seen making their way low over the ground and flying directly into the roost—late stragglers arriving ? By this time it was almost dark and the continuous twittering which had been kept up when the roost was first approached, decreased in volume. The only disturbance noted appeared to be caused by passing trains, when odd birds would spring one-two feet across the bed and alight again. This also happened when I passed the roost at a distance of approximately eight feet, when leaving at 8-45 p.m.

A few Sand Martins (*Riparia riparia*) roosted with the Swallows which were mainly juveniles, although quite a number of adults were present.

I had hoped to continue the observations, but on August 27th the roost was deserted, partly I think due to interference with the Reed-Mace of which a small area had been flattened. Small parties of Swallows did pass over the bed, some birds flying round the roosting area, but later continuing up the Aire Valley towards Keighley, possibly to a new roost.

As literature bearing on the roosting habits of the Swallow family appears to be scarce, I think it would fully repay an observer who locates a roost to enlarge upon these observations, and obtain a more complete survey.

OROBANCHE ALBA STEPH. IN WEST YORKSHIRE

W. A. SLEDGE

Mr. J. N. Frankland's discovery of the Thyme Broomrape at Malham referred to elsewhere in this issue (p. 27) is a record of unusual interest. As this is only the sixth authentic West Yorkshire record during a period of 152 years, it is an appropriate occasion on which to recall the history of its occurrence in Craven.

As detailed in the *Flora Cravoniensis* (1873) under the more familiar and more appropriate name of *Orobanche rubra*, the first two records were due to Dr. Windsor who found the plant ' under the rocks on the east side of Malham Tarn ' in 1801, and ' under Attermire Cove ' at Settle in 1811. In each instance only a single specimen was found. In the *Flora of West Yorkshire* (1888) Lees points out how Windsor remained unaware of the identity of the plant for upwards of 50 years, mistaking it first for *Lathraea* and later for *O. Hederae*. In Windsor's paper on ' Plants found in the neighbourhood of Settle, Yorkshire ', *Phytol. N.S.*, **1**, 349, (1855-56), the plant is listed as ' *Orobanche Hederae* (if not *O. rubra*) ' and the date of the Malham finding is given as 1802. This citation is repeated in Miall and Carrington's *Flora of West Yorkshire* (1862) where the Malham date is erroneously given as 1806.

In *Flora Cravoniensis* another record for the plant at Settle is credited to Mr. Hardy of Manchester. Lees (*loc. cit.*) repeats this entry but in both publications its inclusion in brackets suggests that both authors regarded the record as lacking in authenticity or in some way suspect, though Hardy was a competent botanist. Lees had evidently overlooked Hardy's published record which appeared in *Phytol, N.S.*, **1**, 518, 1856, and is unequivocal. The note runs as follows: ' *Orobanche rubra*— In September 1854 I gathered a tuft of what I took at the time to be this plant, growing among straggling bushes of *Prunus spinosa* on some low rocks about a mile from the town of Settle. It was apparently parasitical on the fine fibrous radicles of *Thymus Serpyllum*, and widely different in " facies " and habit from the *Orobanche Hederae* of the ivy-covered sea cliffs of South Wales and the West of England.'

Fifty-four years passed before the plant was seen again, this time by F. A. Lees who found a single plant growing on Scar ledges at Kettlewell, towards Coniston (*Suppl. Fl. Yorks*, 84, 1941).

In 1919 Mr.—now Professor—V. C. Wynne-Edwards, found a plant ' about five inches high and a fine deep red ' (V.C. W-E *in litt. ad* W.A.S., 27/10/53) on the limestone slopes of Norber, Austwick. Again only a single plant was found. This record has not previously been published and I only became aware of it through Mr. Frankland who was informed of the find by the finder at or about the time the discovery was made, and duly entered it in his notes. I have to thank Professor Wynne-Edwards for further details relating to this find.

Mr. Frankland's own discovery thus bridges another gap of thirty-four years and one of 152 years since the plant was last seen at Malham and first seen in West Yorkshire. The precise locality in which Mr. Frankland found the *Orobanche* was situated at a considerable distance from Windsor's original station and the plant ' had two spikes in full flower and an old dead last year's spike.' One of the flower spikes, carefully cut off so as not to disturb the rooted base was exhibited at the recent meeting in Manchester of the Botanical Society of the British Isles. Hardy's ' tuft ' evidently consisted also of a single group of flower stems rising from a common root system. The other four records are all for single specimens.

There can of course be no doubt that other plants have escaped observation by botanists and Lees was doubtless correct in suggesting (*loc. cit.*) that the record for *O. major* from Ingleton in Baines' *Flora* (1840) was more likely to be *O. rubra*. As however the area within Craven from which all the records for the Thyme Broomrape have been made has been investigated so thoroughly and for so long by both resident and visiting botanists it is equally certain that this species must be considered amongst the rarest of all West Yorkshire plants.

FIELD NOTES

***Trollius europaeus* L. in Billingham Marshes**—Industrial development on Tees-side has, during the past century, been responsible for enormous changes in the topography of the area. The great expanses of marsh, salt-marsh and mud-flat

which bordered the Tees on both sides of the estuary and for some distance inland, have been steadily reduced in extent by drainage and by the tipping of millions of tons of slag and other waste matter from the iron works, and other sources, with the resultant limitation of feeding and nesting places of certain species of birds, and the more or less complete extermination of various interesting marsh and sea-side plants.

Among the last and most beautiful of the flowers to be threatened is the *Trollius* of the marsh known as Billingham Bottoms in south-east Durham. At one time covering thickly an area of approximately an acre in extent with a considerable sprinkling round about, the lovely Globe-flowers are being sacrificed to the need for a place to dispose of refuse from the new town of Billingham.

With the support of the Cleveland Naturalists' Field Club, efforts have been made to save the plants and the local authorities have shown considerable interest and sympathy, but it was felt that the tipping could not be halted.

A suggestion that a number of the plants might possibly be transferred to some other suitable site was favourably received and Mr. A. Bishop, Supervisor of Open Spaces in Billingham, undertook to transplant a quantity of the *Trollius* roots to a position a little to the west of the original station. This has now been done and thanks are due to Mr. Bishop for his efforts. Mr. Bishop states that the new station will not be tipped upon, and we are hopeful that it will remain undisturbed for a long time to come. Whether the plants will succeed in establishing themselves remains to be seen but the solution adopted was the best that presented itself.

Trollius europaeus possibly found its way to Billingham from Upper Teesdale in the long past and, as might be expected, slight differences have appeared in the plants. These differences, with much other matter concerning the type, are given by Professor J. Heslop Harrison in his valuable ' Survey of the Lower Tees Marshes,' published in the *Transactions of the Natural History Society of Northumberland, Durham and Newcastle-on-Tyne*, Vol. 5, part 1 (1918). He there suggests the name of *relictus* for the type.

The fact that a mountain-loving plant should flourish happily in a low-lying position near the sea—the marsh is not many feet above sea-level—is itself interesting and suggests a similarity of atmosphere and general conditions. Other upland plants including *Primula farinosa* occurred here before reclamation obliterated them. This similarity of condition has often been remarked when considering species which occur in both upland and seaside habitats. Comparable also is the case of a number of birds, *e.g.*, the Snow-bunting and the Wheatear which are found in both situations, but, except when on migration, rarely in between.

Another attempt to preserve the Billingham *Trollius* was discovered on a visit to a private nature reserve near to Crookfoot Reservoir, five miles north of the Billingham marsh site, where upwards of twenty clumps are flourishing in moist ground. They have been transplanted at various times by the owner of the ' reserve,' Mr. J. A. Ainsley, and show much promise of succeeding.—O. C. HILL

***Poria xantha* (Fr.) Sacc.**—When I overturned a large burnt log, under a Rhododendron bush, on the Y.N.U. fungus foray at Bramham Park, I was lucky to find a large resupinate sulphur-yellow polypore. I took pieces home and it proved to be *Poria xantha* (Fr.) Sacc. This was later confirmed at Kew. To my surprise it was not listed in Mason & Grainger's *Yorkshire Catalogue*. In Carleton Rea's *Additions to British Basidiomycetae* it is said to be rather uncommon and only to occur in winter months. The whole specimen collected was about 10 cms. in length, sulphur-yellow in colour, effused and confluent in some places.—R. WATLING.

***Physomitra esculenta* Boud. (*Gyromitra esculenta* (Pers.) Fr.).**—One of the highlights of spring in the minds of Halifax mycologists is to find this fungus growing in the same position where C. Crossland first found it. For the last two years no fruiting bodies have been seen, but on April 5th with a friend I looked as usual. On arriving at the bank, to our horror we found a man was burning it. The following week, however, we again visited the situation as we have done for the past five years. The butterbur (*Petasites vulgaris*) has in recent years died out and the dominating plant is now Sweet Cicely (*Myrrhis odorata*). Round some of these plants were growing a large number of this brain fungus. We counted 22 of various sizes. On average the height was 8 cms. with the convoluted pileus 8 cms. wide. The stem measured 3 cms. in thickness.—R. WATLING.

THE YORKSHIRE NATURALISTS' UNION: NINETY-SECOND ANNUAL REPORT

(Presented at Halifax on Saturday, December 5th, 1953)

The Ninety-first Annual Meeting was held at the Yorkshire Museum, York, on Saturday, December 6th, 1952, by kind invitation of the Yorkshire Philosophical Society, of which the York and District Field Naturalists' Society is a Section. The Annual Report for 1952 was presented there and is printed in *The Naturalist*, 1953, pp. 23-45.

The Presidential Address was delivered by Professor E. A. Spaul, D.Sc., Ph.D., on ' Colour and Survival '.

The Presidency for 1954 has been offered to and accepted by Rev. T. B. Kitchen.

The Excursions for 1954 will be held at:

V.C. 61. Land of Nod, June 19th.
V.C. 62. Goathland, July 3rd.
V.C. 63. Todmorden, July 17th.
V.C. 64. Austwick, June 5th-7th.
V.C. 65. Tanfield, May 29th.

New Members.

Allen, W. E. H., 36 Priesthorpe Avenue, Stanningley, Leeds.
Beck, W., 18 Aspin Lane, Knaresborough.
Caulton, Mr. and Mrs., 45 Ash Grove, Headingley, Leeds 6.
Cooper Ian, Green Garth, Thorner Lane, Scarcroft, Leeds.
Fenton, K., 44 Seafield Avenue, Holderness Road, Hull.
Lapper, Miss M., Malham Tarn House, via Settle.
Lawton, F., Stockbridge House Exp. Sta., Cawood, Selby.
Maycock J. C., M.A., St. John's College, York.
Morpeth, Lord, Coneysthorpe, York.
Odgers, M., 17 Belgrave Road, Bridlington.
Quick, A. H., Greengarth, Quarryside Road, Mirfield, Yorks.
Rankin, M. N., M.B., Oakdale, Hemsworth, Pontefract.
Reynolds, C., Ryedale, Dennett Road, Beverley.
Slater, F., 20 Mostyn Avenue, Bury, Lancs.
Smith, A. H. I., B.Sc., 391 Fulford Road, Sheffield 10.
Watling, Roy, 20 St. Anne's Road, Skircoat Green, Halifax.
Willoughby, the Hon. M., Birdsall Grange, Malton.
Wood, Miss M., 82 Church Lane, Eston, Middlesbrough.
Wright, D., 112 Valley Road, Meersbrook, Sheffield 8.

The following have ceased membership:
G. V. Baxter; A. Beaumont; W. G. Birch; Mrs. Braham; Lt.-Col. R. S. P. Bates; J. R. Dibb; Rev. L. A. Erving; Mrs. M. M. Gill; F. N. Hepper; S. M. Jackson.

Death.

W. E. L. Wattam.

Changes of Address.

A. C. McAllister to 49 Telford Street, Holderness Road, Hull.
W. G. Bramley to East Villa, Eastfield Road, Pickering.
Miss A. Cherry to 61 Scott Lane West, Riddlesden, Keighley.
D. E. Caulton to 45 Ash Grove, Leeds 6
E. Dearing to 37 Omerod Street, Burnley.
W. F. Fearnley to Foyle, King's Road, Ilkley.
Dr. J. Eastwood to 14 Knowle Lane, Meltham, Huddersfield.
H. Henson to 24 Elmete Avenue, Leeds 8.
P. S. Kenyon to Lake View Guest House, Burtonport, Donegal.
R. Lewis to 54 Greenside, Kendal.
J. H. Leach to Elm Grove, Bare, Morecambe.

T. Platt to The Chestnuts, St. Andrews Road, Burnham-on-Sea, Somerset.
A. W. Ping to 8 Galtres Grove, Clifton Without, York.
H. A. Robinson to Summer House, Hangingstone Road, Ilkley.
D. A. Rushforth to 199 Wakefield Road, Drighlington, Bradford.
R. Slater to Redwings, Linden Chase, Uckfield, Sussex.
C. R. Shoesmith to 16 Marlborough Avenue, Manor Drive, Halifax.
Miss M. M. Taylor to 9 View Road, Keighley.
I. Morley to 22 Stanley Road, King's Cross, Halifax.
H. J. Williamson to Bankfield, Victoria Avenue, Ilkley.

The Union's Activities in 1953 included a weekend Natural History Course organised in conjunction with the North Riding Education Committee and held on September 11th-16th, at Wrea Head College, Scalby, near Scarborough. The course arose out of the Executive's decision to extend Union activities and try to attract new members by providing a course for inexperienced naturalists and would-be naturalists which combined instruction with field-work.

The Course was very successful and was favoured by excellent weather conditions. One excursion was devoted to the geology of the district under the leadership of Dr. H. C. Versey. Professor E. A. Spaul conducted a party to Ravenscar on the second day for an introduction to Marine Biology. The following day was spent in a tour of the Forestry Commission's extensive plantations, Mr. P. F. Garthwaite and the Head Forester explaining the work in progress. Mr. W. D. Hincks and Dr. W. A. Sledge conducted the last excursion when special attention was given to entomology and botany. Short talks were given by leaders each evening to explain the main features of the following day's work. In addition Capt. G. K. Yeates gave an ornithological lecture one evening and Mr. J. P. Utley showed a series of lantern slides illustrating North Riding scenery.

The course was fully booked up and the enthusiasm and keenness shown by all who attended abundantly confirmed the success of the venture.

Arrangements have been made to hold another instructional course at Wrea Head on July 2nd-7th, 1954, and if possible a comparable course at Grantley Hall at a later date. Anyone interested is eligible to attend these courses notice of which will be advertised in due course in *The Naturalist*.

FRESHWATER BIOLOGY

(H. Whitehead).—The season has been a poor one for most sorts of out-door natural history due to the variation of the weather during the year. An early drought reduced the flow of the streams and rills, many being dried up, which must have had a serious effect on the stream life. Although this is difficult to assess in the streams themselves the mating flights have been much reduced. This agrees with other insect groups all of which have been a disappointment to field naturalists. Long spells of cold winds have kept Mayflies and Caddisflies sheltering under leaves and stones though Stoneflies have not been troubled quite so much. At Austwick the Perlas which are usually so abundant were much reduced in number. Some of the smaller Caddises like *Psychomyia* and *Tinodes* seemed plentiful but this may be because they were the few that were found in the net when sweeping the vegetation in the hope of finding the larger species. *Odontocerum albicorne* Scop. was certainly the usual result of sweeping the grass edges of the stream and the overhanging trees. It appears to have a long season from early June to October.

Odd species of the *Baetis* genus of Mayflies were usually present and these were found far from the water. On the road over Swarthmoor they are frequently seen in plenty on sunny days. After a week of wind and wet days an odd fine day gave an opportunity of sweeping overhanging trees and produced a number of species of Caddisflies.

The field meetings of the Union were not all fruitful for freshwater biology. The Grinton meeting gave a useful harvest of flying insects and two species of Diptera which live on the shingle beds in the streams were plentiful. Rain interfered at Collingham and at Bretton, and North Cave was a waterless area. At Helmsley the lack of insects was attributed to the nature of the stream bed. Entomologists working on other groups at Helmsley reported that insects were scarce so it is possible that the weather factor may have operated as well.

MAMMALS, REPTILES, AMPHIBIANS AND FISHES

Mammalia (Mrs. A. Hazelwood): CHEIROPTERA: Bat notes are still scanty, mainly due to difficulties of identification of casual sightings. The Noctule and Daubenton's Bat are reported from Helmsley.

INSECTIVORA: Reports of Hedgehogs dead on the road are dwindling though the animal itself shows no sign of diminution. It may be that the extirpation of many roadside hedges has pushed the hedgehog populations away from the danger area. All three shrews have been reported during the year and the Water Shrew is said to be abundant in the Hebden Bridge area.

CARNIVORA: Both Fox and Badger appear to be more than holding their own, the former despite sustained persecution. It is difficult to believe that the occasional depredations made by foxes upon poultry and game outweighs their undoubted value as rabbit killers. It may be significant that the recent activities of fox clubs date from the post-war scarcity of rabbits which may have induced the foxes to seek less lawful game.

A few Otters are reported but Stoats and Weasels are generally agreed to be less common than of late years.

Both Common and Atlantic Seals are reported from the Humber.

RODENTIA: Many observers report that Red Squirrels show gratifying signs of increase, especially in the Hebden Bridge-Halifax-Dewsbury area. Grey Squirrels on the other hand seem to be checked although large numbers are still killed on some estates. Mr. Chislett reports a Grey Squirrel feeding upon a fungus which was subsequently identified as *Russula cyanoxantha* (Schaeff.) Fries. The Voles and Mice seem to be mid-cycle, neither unusually abundant nor noticeably scarce. An Alpine Hare was seen on Shackleton Moor near Hebden Bridge. Mr. Carr reports Short-tailed and Bank Voles and the Common Shrew to be ' extraordinarily numerous '. Many nests containing young have been found, possibly due to late-cropping of grass, etc., which has hindered owls and other predators from killing off the usual numbers of adult stock. Neither cats nor dogs eat Shrews.

UNGULATA: Red and Fallow Deer still occur in a wild state in the Helmsley area. Fallow Deer, believed to have originated with the Cannon Hall herd, have been noted from High Hoyland.

Reptiles: Several observers report an increase in Grass Snakes, but in recent years many have been imported and a large proportion contrive to escape. These escapees are more readily to be seen than wild snakes. On the other hand the snake is reported from remoter districts where it is more than likely to be truly wild.

The Slow Worm is reported as abundant at Helmsley. Mr. Taylor records that when skinning a freshly-killed Slow Worm the work was interrupted and the skin with the head attached and the fractured tail was placed in a damp jar. Work was resumed twenty-four hours later. On making an incision in the tail, it commenced once more to jump about, much as it did when first detached. Thus the reflex action remained capable of being ' triggered off ' for 24 hours after the nervous system had ceased to function.

Amphibians: Frog. Mr. Butterfield gives details of two lily ponds in Glusburn, in the first of which spawn was deposited on March 6th. In the second pond spawn was not seen until March 24th, about the same time as a second wave of spawning occurred in the first pond.

A most interesting note comes from Mr. Garnett, who records a frog croaking at 19.25 G.M.T. on August 22nd. He suggests that this may be a gathering signal from a communal hibernaculum. The croaking came from a woodpile where frogs have been found hibernating in previous years and autumn croaking has also been noted in other years.

The Palmated Newt is reported from Helmsley.

In conclusion may I thank all those who have kindly contributed their notes, thus having made this report possible.

ORNITHOLOGY

Interim Report (Ralph Chislett): The full report for 1952 was duly reprinted and copies made available to contributors and others interested.

At the March meeting of the Section, A. Hazlewood exhibited a White-billed Diver from the Humber and a Water-Pipit from Spurn. The two forms of Yellow-hammer also shown were referred to in the 1952 Report. At the evening meeting G. H. Ainsworth spoke concerning the ringing data obtained during seven years at Spurn; slides by E. J. Hosking and T. M. Fowler and others illustrated the talk. Sound recordings of songs and calls of a Nightingale and other species, made by Messrs. Dawson and Thompson, concluded the programme.

The dry early months were followed by a wet late spring and early summer, but the breeding season was moderately successful. Woodlarks and Nightingales bred in the south of the county, and Little Ringed Plovers at two places. B.T.O. enquiries concerning the Heron, Great Crested Grebe and Canada Goose were supported. Dotterels occurred on Rombald's Moor in spring, and Crossbills at several places from June onwards. A Nightingale sang from a bush on the cliff at Runswick Bay, and a Hoopoe caused excitement at Whitby in early October.

The eighth year of the Spurn Bird Observatory began very well with the ringing of *c.* 100 Snow Buntings by enthusiasts who paid visits in the winter months. Four Crossbills have been ringed. Many fewer Linnets and Willow Warblers have been caught than usual, but Greenfinches show an increase. The opening of new observatories, notably at Dungeness, has made it necessary for Spurn to rely more and more on Yorkshire people for keeping the place manned, and there have been some generous responses to Mr. Ainsworth's efforts to get blank periods filled; sometimes at times inconvenient to those who have responded.

At the Sectional Meeting on October 17th, Mr. Ainsworth appealed, eloquently, almost despairingly, for support for his effort to have the Spurn Peninsula declared a Nature Reserve. Whilst the effects of the floods of January 31st are still visible, they had less effect on the breeding birds than the subsequent, human, summer visitors. The Union and the affiliated societies could at least each pass resolutions in favour of the proposal and send copies to the Clerk to the East Riding C.C. at Beverley, and so remove a possible impression that only the Spurn Bird Observatory officials are interested. The cottage often shelters naturalists with interests in other branches and students from several universities whose influence might be effective if exerted.

Members are requested to send in records before the year end if possible, and to let the Recorders have the remainder immediately afterwards, so that the 1953 Report may be in galley proof form well before the March Meeting. This leaves only the month of January for sorting and sifting, editing and writing.

CONCHOLOGY

(Mrs. Morehouse): There are few records of outstanding interest this year. To G. Fryer goes the honour of discovering *Planorbis dilatatus* Gould, which he took from the canal at Golcar, Huddersfield, in July. This is a new record for Yorkshire. He also found the keeled variety of *P. Jenkinsi* Smith, in a pond among allotments at Longwood and from Huddersfield.

On May 9th at Bolton Percy nine species were taken including *L. glabra* Müll.

At the Y.N.U. Meeting on June 13th, 1953, at Collingham, six freshwater species were seen, also fifteen land molluscs. *Ena obscura* Müll, was fairly abundant. At Linton on the above date Mr. E. Dearing took nine species. *H. hortensis* was very common while *H. nemoralis* L. was uncommon. Caddis cases taken from the pond in the Woodhall School grounds were covered by *P. jenkinsi* Smith, *L. truncatula* Müll., a few *Pisidium* and *L. pereger* Müll.

Mr. Wallis and Mr. A. Smith report that the pond at Cayton Bay, where *Vivipara contecta* Millet, was introduced in 1903 and thrived, was drained in the spring of 1953.

Mr. Smith took a fine lot of *Valvata piscinalis* Müll, from Pond Head on the Pocklington Canal. At Melbourne he found *Vivipara contecta* Millet, in good numbers and a few *V. vivipara* L.

H. aspersa v. *lutescens* Cockerell, turned up at Hutton Bushell. This is an old habitat found by W. Gyngell in 1909.

H. nemoralis v. *citrinozonata* Cockerell, was found by Mr. A. Wallis on Castle Hill, Scarborough, in June. He also reports that *Theba cantiana* Montagu, has extended its range between Cloughton and Lindhead Hill.

Mr. E. Robinson reports *Pisidium pusillum* Gmel. found in ponds in fields at Wheat Ing, Crimsworth Dene, Broadhead Clough, below Hollock Lea House, below

Bower's Mill, Blackburn Valley and Bogfield above Wade Wood, Luddenden Dene. The associates of the *Pisidium* were *L. truncatula* Müll. and many *Gammarus*.

The writer found *Arion ater* v. *alba* L. in the garden at Doncaster in September.

The only marine mollusc of note is *Crepidula fornicata* L. picked up in the South Bay, Scarborough, in February and taken to the Woodend Museum. This is unusual so far North. The record comes from Mr. Wallis. The mollusc may have been carried there by the storms from the Lincolnshire coast.

ENTOMOLOGY

Lepidoptera (E. Dearing): This report is prepared from notes submitted by W. Beck, J. Briggs, the Bradford Naturalists' Society, E. F. Gilmour, C. R. Haxby, F. Hewson, P. S. Tannett, and the Hebden Bridge Literary and Scientific Society.

The weather during the season has been decidedly variable, with a pronounced spring drought followed by a period of heavy rain. All broods of ' The Whites ' have been smaller than usual from reports received, whilst migrant species have been far less common than usual. *Vanessa atalanta* L. and *V. cardui* L. in particular have been uncommon in the Bradford area, and almost absent from the Upper Calder Valley. *Nymphalis io* L., however, became common on Skipwith Common where Mr. Haxby saw large numbers on August 8th, a phenomenon seen once more early in September by Mr. Hincks. This experience has not been usual through the county.

Records of interest are as follows:

Hypocrita jacobaeae (L.) (63). A new small colony at Cross Lanes, Hebden Bridge; larvae v. com. at Esholt in August.

Cycnia mendica Clerck. (61). Skipwith Common; P.S.T.

Arenostola phragmitidis Huebner. (64). In large numbers Askham Bog, 8/8; J.B. and C.R.H.

Atethmia centrago (Haworth) (63) at M.V.L., Shipley, 4/9; F.H.

Zanclognatha tarsipennalis Treitsche. (64). Gledhow, Leeds, 14/7; P.S.T.

Calocalpe cervinalis Scopoli (63) at M.V.L., Shipley, 10/9; F.H.

Lygris dotata L. (64). A few at Askham Bog, 8/8; J.B. and C.R.H.

Triphosa dubitata L. (64). Gledhow, Leeds, 5/9; P.S.T.

Semiothisa liturata L. ab *nigrofulvata* (63). Deffer Wood, Barnsley, 6/6; J. B. and C.R.H., and (64). Wigton, Leeds, 1/8; P.S.T.

Deuteronomos fuscantaria (Haworth) (64). Gledhow, Leeds, 5/9; P.S.T.

Deilephila porcellus L. (63). 1952 at Honley and 9/6/53 Meltham; E.A.

D. elpenor L. (63). Large numbers Bradford area; com. Huddersfield and the Calder Valley as far west as Hebden Bridge.

Herse convolvuli L. (63). Guiseley, 2/9; R. Beck. Wakefield Road, Huddersfield, Sept.; E.A.

Daphnis nerii L. (63). One female Doncaster, 26/9; E.F.G.

Acherontia atropos L. (63). Four in Doncaster area; E.F.G.

Lasiocampa quercus L. (64). An unusual dark bandless form from Ilkley Moor, 18/6; P.S.T.

Procris statices L. (63). Hapton Springs, near Huddersfield, 9/6; E.A.

P. geryon Huebner. (62). Flying in large numbers, Gundale, Pickering, 7/6; J.B. and C.R.H.

Aegeria tipuliformis Clerck. (64). Gledhow, Leeds, 28/6; P.S.T.

There is a correction to the 1952 Report as follows:

Ecliptopera silaceata Schiff. should read—2/6/52, Grass Woods, Grassington; C.R.H. (64) instead of—Gaisby, Shipley (63).

Mr. J. Briggs writes as follows:

Report on a Mercury Vapour Light-Trap in my garden at Little Horton, a built-up area of Bradford, from April to October, 1953

The light was on from dusk until dawn every night where possible, the exceptions being when away from home and on very wet nights when there was a danger of losing a bulb, these being very expensive.

The minimum night temperature recorded on an ordinary maximum and minimum thermometer was taken each morning and the wind direction noted. Careful check was made of the ' macros ' only, this often taking two hours. All the

common moths (Dark Arches, Large Yellow Underwings, Cabbage, Magpie and Bright-line Brown-eye) which I consider to be pests in my nursery-garden were fed to the poultry, which relished all except the Magpies, these being left severely alone. The remainder, which I considered harmless, I released at varying distances of over a quarter of a mile away.

Commencing on April 13th the trap was operated on 146 nights up to October 16th. In this period 16,735 ' macros ', of 132 species, were taken, an increase of 5,643 over the catch in a similar period last year. Only on five occasions did the trap draw blank, surprisingly on the 2nd and 3rd June. The wind was due north and the minimum night temperature was 43°, well below the average for early June. The last three nights, October 14th, 15th and 16th, also drew blank and again the wind was northerly, the minimum temperature 38°. The peak period of activity was ten days later than the previous year, occurring during the spell of fine weather in the first fourteen days of August.

On August 4th, 1,053 moths of 44 species were taken, and on August 8th 1,122 again of 44 species. Nearly two-thirds of these were of two species, *Xylophasia monoglypha* (Dark Arches) and *Triphaena pronuba* (Large Yellow Underwing).

Between June 20th and September 17th, 4,202 *Xylophasia monoglypha* came in, an increase of 1,533 over 1952, and 2,492 *Triphaena pronuba* between June 7th and September 26th, an increase of 1,394. This moth has the longest season of any species recorded in my trap.

Other notable comparisons include 431 *Xylophasia crenata* (Clouded-bordered Brindle) in 1953 against 22 in 1952; 416 *Apamea sordens* (Rustic Shoulder Knot), 89 in 1952; 626 *Celaena secalis* (Common Rustic), 258 in 1952; 662 *Procus strigilis* (Marbled Minor), 274 in 1952; and 143 *P. literosa* (Rosy Minor), 35 in 1952.

It would appear from these figures that last winter was favourable for the low feeding, hibernating larvae of these species. Other increases were *Charaeas graminis* (Antler) 178 in 1953, 13 in 1952; 206 *Leucania impura* (Smoky Wainscot) against 85; 46 *Plusia v-aureum* (Beautiful Golden Y) against 13; 853 *Hydraecia micacea* (Rosy Rustic) against 543; and 293 *Amphipyra tragopogonis* (Mouse) against 76. On the other hand *Plusia chrysitis* (Burnished Brass) showed a decrease of 145; *Amathes xanthographa* (Square-spot Rustic) of 133; *Diataraxia oleracea* (Bright-line Brown-eye) of 44; *Mamestra brassicae* (Cabbage) of 57; *Orthosia incerta* (Clouded Drab) of 160; and *Xanthoroe fluctuata* (Garden Carpet) of 62.

Three species new to the Bradford Naturalists' Society's records were taken. *Hydraecia petasisis* (Butterbur), August 10th and Septefber 8th; *Heliophobus anceps* (Bordered Gothic), July 2nd; and *Leucoma salicis* (White Satin), June 26th. There is a possibility that the latter may be the second generation or a delayed emergence from escapes of larvae I obtained at Formby in 1952.

New to my trap were *Mormo maura* (Old Lady), August 10th; *Drepana falcataria* (Pebble Hooktip), June 23rd; *Ortholitha mucronata* (Lead Belle), June 29th; and *Dyscia fagaria* (Grey Scalloped Bar) on July 9th.

Although there is a very large colony of *Abraxas grossulariata* (Magpie) situated only 130 yards due west of the trap (with two rows of houses between), only eight were intercepted and only five entered the trap, a similar occurrence to last year.

Ninety per cent. of the total capture were males, the largest percentage of females, (25 per cent.) occurred in the species *Biston betularia* (Peppered). This species showed a tendency to revert to the type, white speckled with grey, which of late years has been exceedingly rare in Bradford. Several intermediate forms also appeared.

On August 7th an experiment was made by placing a black (Ultra-violet) light-trap only ten yards away from the Mercury-vapour one, a screen of poplars only dividing them. Results showed that the two most common species preferred the black lamp, this trap being crowded with 417 *Xylophasia monoglypha*, 134 *Triphaena pronuba*, and 183 of other species, a total of 734. In the Mercury-vapour trap were 283 *monoglypha*, 92 *pronuba* and 131 others, a total of 506. On the following night, August 8th, the two traps were again operated and again the Ultra-violet intercepted the majority of the *monoglypha* and *pronuba*, 715 of a total of 810, whilst the Mercury-vapour took 640 of these species, but in addition 500 moths of 42 other species. In my opinion the restless activity of the two commoner species drives away many of the smaller moths, especially the geometers.

Orthopteroid and Neuropteroid Orders (W. D. Hincks): There is very little to report in regard to the several orders here included, during the past year. Dr. E.

Broadhead's important work on the Psocoptera has progressed favourably but is not yet completed. He showed an interesting series of exhibits illustrating his work at the Eighth Congress of British Entomologists at Leeds in July.

A few noteworthy points in regard to the Orthoptera may be mentioned. During our visit to Spurn in July it was interesting to find that the two bush crickets *Roeseliana roeselii* (Hagenbach) and *Conocephalus dorsalis* (Latreille) were still to be found sparingly in their recorded stations of Long Bank Dyke and Walker Butts Bank Dyke despite the fact that these areas had been completely inundated by salt water in the flooding of January. Evidently the eggs are so placed as to withstand the saline conditions as is also the case with the grasshoppers of Spurn, colonies of which occupied their usual positions in areas of the Warren which had been inundated in the winter. In Walker Butts Bank Dyke it has remained for man to be the final means of extermination as this renowned and most interesting area was in process of being ' bulldozed ' towards the end of our July visit, for the purpose of building a higher bank and a new dyke some distance further inland.

The most interesting orthopteran of the year was a fine male of *Metrioptera brachyptera* (L.), taken in a heather-covered clearing in the middle of the Forestry Commission's Wykeham Forest, V.C. 62, on September 12th. The Senior Research Officer, who was present at the time and who is familiar with the common insects of the forest, had not previously seen a bush cricket in the area so it is probably extremely local. The headquarters of this species in Yorkshire is at Thorne where Dale took it as long ago as 1837. Porritt took it there towards the end of last century and Bunting has collected it quite commonly in recent years. In addition there is a record by Porritt from Strensall and the Rev. T. B. Kitchen took a nymph at Dunnington, near York, in June 1947.

Hymenoptera (W. D. Hincks): The past season has certainly been a better one for Hymenoptera than 1952, largely because of the lack of early frosts which closed the season abruptly during the first week of September last year. The recorder has been able to visit a number of localities in different parts of the county during the year and fairly extensive collections have been made. In addition Mr. F. Hewson has kindly given me some Ichneumonidae among insects taken at light in the Bradford district, and Mr. Bunting has sent records from Thorne.

During the year the Hymenoptera portion of the Section's Spurn Report has been published and includes 12 new British species, 97 new Yorkshire records, and 84 new records to vice county 61, a total which testifies to the richness of the area and to the thoroughness of the Section's survey.

Much of the material collected during the year has still to be worked out so that it is not possible at this stage to prepare a list of additions to the Yorkshire list. It is therefore proposed to deal with this at a later date. During the excursion of the Eighth Congress of British Entomologists to Askham Bog in July there was a brief period, a matter of minutes, when the otherwise persistent rain permitted a few insects to be picked from the undersides of leaves, etc. One of the specimens thus taken proved to be a new species of the Chalcid genus *Aphycus*. An interesting new species of Fairy fly belonging to the genus *Lymaenon* was taken at Allerthorpe Common on September 1st. Mr. Shaw has been working during the year on the parasitic Cynipidae and has made a number of additions to the Yorkshire list. These, together with the other novelties resulting from the season's collecting will be published in *The Naturalist* at a later date.

Hemiptera (J. H. Flint): The year as a whole has not been a bad one for Hemiptera, and there seems to have been no shortage of specimens in the field. Much of the material collected, however, still remains to be named, but some interesting species have been noted.

In my last report I noted that Mr. Horsman had brought to me a single male specimen of *Cymatia bonsdorrfi* Sahl. which he had taken at Barnbow. A search in April this year failed to reveal any specimens, but in September Mr. Horsman and I both took further examples, all the specimens being brachypterous. The species may be regarded as well established in this pond. The pond has a clay silt bed, and examination of similar ponds, though these are scarce in the district, may extend its known distribution.

Mr. E. S. Brown (*E.M.M.*, 1951, 297) has given details of Tamanini's work on the genus *Velia* and this affects the British list. *Velia currens* F. must be removed, and

V. caprai Tam. and *V. saulii* Tam. substituted. *V. caprai* appears to be common and widely distributed, though records will be needed to confirm this, but *V. saulii* is comparatively rare. The first specimen of *V. saulii* to be taken in the county was a typical macropterous male by Mrs. Flint on Lindley Moor (V.C. 64) in April, 1952. This specimen, which was later set aside from the general collection was unfortunately lost during domestic ' tidying up ', and I did not publish the record until I had seen further examples from other localities. This year (1953) Mr. Horsman brought to me for checking specimens of *V. saulii* taken at Barnbow (V.C. 64) and subsequently from the Wykebeck Valley, Leeds, the latter locality producing several macropterous specimens. In May I found *V. saulii* to be quite common on the pond and the beck at Barnbow. Mr. Horsman has since produced specimens from both banks of the River Swale at Brafferton, and as the river is the boundary between V.C.s 62 and 65 the species must presumably be added to both vice-counties. The brachypterous females of these two species are quite readily separated, and I would be grateful for any material, mounted or unmounted, that would help to record the distribution of the two species.

I am grateful to Mr. W. D. Hincks for material collected by Mr. J. Wood and himself, and to Mr. H. M. Russell and Mr. J. Horsman for specimens submitted. The species listed below include some that are quite common, but have not been previously recorded for the vice-county quoted. All the determinations have been made by the writer.

Heteroptera

Aradus depressus F. (*61). Skipwith Common, 5/37; W.D.H.
Tingis cardui L. (*64). Scarcroft, at grass roots, 24/1/53; J.H.
Orius niger Wolff (†61). Skipwith Common, 7/9/49; W.D.H.
Xylocoris cursitans Fall. (*64). Thorner, 7/4/53; J.H.F.
Phytocoris populi L. (64). Gledhow Valley, on lime trees, 7/53; J.H.F.
P. dimidiatus Kbm. (*64). Golden Acre Park, Leeds, on oak, 7/53; J.H.F.
P. pini Kbm. (64). Alwoodley, Leeds, on pine, 7/53; J.H.F.
Orthotylus flavosparsus Sahl. (*64). Arthington Bank, 30/7/53; J.H.F.
Cymatia coleoptrata F. (*63). Wentbridge, commonly, 4/53; J.H.
Corixa stagnalis Leach. (*64). Barnbow, 9/53; J.H.F.

Homoptera

Centrotus cornutus L. (*62). Rydale, near Helmsley, on brambles, 6/53; H.M.R.
Ulopa reticulata F. (*64). Pockstones Moor, on heather, 8/53; J.H.F.
Oncopsis flavicollis L. (64). Golden Acre, Leeds, 8/53; J.H.F.
Erythroneura angustata Leth. (*64). Aberford, on hawthorn, 26/5/53; J.H.F.
Typhlocyba jucunda H.S. (*64). Gledhow Valley, Leeds, on alder, 7/53; J.H.F.
(There is only one previous record in the county: Millhouses (63), 1933.)
Cicadella abrotani Dougl. (*61). Kilnsea, 7/52; J.H.F.
C. loewii Then. (†64). Gledhow Valley, Leeds, on sycamore, 7/53, 8/53; J.H.F.
Very scarce; only one tree yielded about half a dozen specimens.
Dikraneura variata Hardy (*64). Wyke, near Leeds, 23/5/53; J.H.F.
Cixius distinguendus Kbm. (64). Fewston, 8/52; J.H.F.
C. similis Kbm. (62). Rydale, near Helmsley, 6/53; H.M.R.
Psyllopsis fraxini L. (*64). Collingham, on ash, 13/6/53; J.H.F.

Odonata (J. H. Flint): There is little to report on dragonflies. By far the most interesting species seen was a single female of the rare *Lestes dryas* Kby. taken by Mr. P. Tannett in V.C. 62 near Boroughbridge in August. This is the most northerly record in England, and the insect has only been recorded in the county previously from Spurn.

Plenty of specimens of *Agrion splendens* Harr were seen at Woodhall Bridge in June, providing confirmation of reports that a species of *Agrion* was to be found along this part of the Wharfe, though specimens had not been examined before. In August a single nymph of *Aeshna juncea* L. was found in a Sphagnum pool on Pockstones Moor at 1,300 ft. *Aeshna* spp. are regularly seen flying at such altitudes, but are difficult to catch and it is pleasant to be able to record the actual species in its breeding habitat.

Coleoptera (G. B. Walsh): This year has been a very poor one for collectors, and a large number of members of the Committee have been unable to do any collecting at all, though intensive work in some areas has yielded fairly satisfactory results. Mr. W. O. Steel has concluded his paper in *The Naturalist* on the Staphylinidae of Spurn, and Mr. H. M. Russell has published a short paper on some of the interesting beetles of the Scarcroft area. With these two papers, the reports submitted by the members and some records left over from last year, the following satisfactory report has been built up; it includes 37 new county records and 45 new vice-county records—V.C. 61, 25; V.C. 62, 7; V.C. 63, 5; V.C. 64, 8.

The following initials are used:

M.D.B.	...	M. D. Barham	T.B.K.	...	Rev. T. B. Kitchen
E.G.B.	...	E. G. Bayford	R.L.	...	R. Lawson
H.B.	...	H. Britten, Jr.	K.M.	...	K. Middleton
W.B.	...	W. Bunting	A.M.R.	...	A. M. Robertson
J.H.F.	...	J. H. Flint	H.M.R.	...	H. M. Russell
W.J.F.	...	W. J. Fordham	S.S.	...	S. Shaw
E.F.G.	...	E. F. Gilmour	W.O.S.	...	W. O. Steel
W.C.H.	...	Rev. W. C. Hey	M.L.T.	...	M. L. Thompson
W.D.H.	...	W. D. Hincks	G.B.W.	...	G. B. Walsh

CARABIDAE

Carabus granulatus L. (62). Whitby, H.B.; Langdale End, A.M.R.

Leistus spinibarbis (Fabr.) (62). West Ayton, August, 1950; A.M.R.

Notiophilus hypocrita Putz. (62). Broxa, 24/8/53; A.M.R. (*64). Arncliffe, 5/49; Lindley Moor, 4/44; Beamsley Beacon, 4/45; J.H.F. There are plenty of records from V.C. 62, but apart from these records from V.C. 64, none from elsewhere in the county.

N. aquaticus (L.), *N. hypocrita* Putz., *N. palustris* (Duftschm.) and *N. substriatus* Wat., G.R. Harwood Dale, July, 1951; A.M.R.

Bembidion redtenbacheri Dan., R. (*64). Gowthwaite Reservoir, 13/5/51; T.B.K.

B. lunatum Duftschm. (61). Blacktoft, 16/9/51; (64) Barlow, 6/6/52; T.B.K.

B. quadrimaculatum (L.) (62). Peat cuttings near Falcon Inn, Cloughton, –/9/52; E.F.G.

B. articulatum (Panz.) (61). Allerthorpe Common, 22/5/52; T.B.K.

B. iricolor Bed. (†61). Spurn and Kilnsea Saltings, occasional; S.S.

Trechus discus (Fabr.) (62). West Ayton, 1950; A.M.R.

Chlaenius nigricornis (Fabr.) (64). Barlow, near Selby, 2/6/51; T.B.K.

Harpalus tardus (Panz.) (*62). Forge Valley, August, 1950; A.M.R.

H. (Ophonus) diffinis Dej. (*62). West Ayton, August, 1950; A.M.R.

Stenolophus mixtus (Herbst) (64). Barlow, 6/5/52; Healaugh, near Tadcaster, 10/5/50: T.B.K.

Acupalpus dorsalis (Fabr.) (*62). Wykeham, 1951; A.M.R.

Anisodactylus binotatus (Fabr.) (62). Forge Valley, July, 1951; A.M.R. (64) Barlow, 19/6/51, very common in a small area; T.B.K. This is by no means a common species in Yorkshire.

Amara convexiuscula (Marsh.). Fairly commonly distributed on the banks of the Ouse and Humber. (61) Spurn, Stone Creek, Brough, Blacktoft. (64) Barlow; T.B.K.

Feronia vernalis (Panz.) (64). Grimston Park, near Tadcaster, 6/4/52; H.M.R.

F. caerulescens (L.) (62). Scarcroft, in small numbers; H.M.R.

Calathus micropterus (Duftschm.) (64). Ilkley Moor, 4/11/51; H.M.R.

Pristonychus terricola (Herbst) (61). Allerthorpe Common, 20/4/51, 5 specimens; T.B.K. Recorded from this locality, 21/4/24; W.J.F.

Agonum obscurum (Herbst) (62). West Ayton, 20/12/51; A.M.R. Local in Yorkshire.

A. piceum (L.) (62). Castle Howard, in old nest of moorhen, 20/5/52; T.B.K. Local and rare in Yorkshire.

A. thoreyi Dej., var. *puellum* Dej. (64). Askham Bog, 25/4/52; T.B.K.

Mr. Wm. Bunting has carried out some intensive work on the water-beetles of the Thorne area, near Doncaster (V.C. 63), and the identification in each case has been checked by Prof. F. Balfour-Browne. The following are the more interesting species, with the usual signs prefixed.

Haliplidae

Haliplus confinis Steph., *lineatocollis* (Marsh.), *ruficollis* (De G.), *immaculatus* Gerh.

Dytiscidae

Laccophilus minutus (L.).
Hygrotus inaequalis (Fabr.), †*quinquelineatus* (Zett.), *impressopunctatus* (Schall.), †*impressopunctatus* (Schall.) var. *lineellus* Gyll.
Hydroporus dorsalis (Fabr.), *lineatus* (Fabr.), *tristis* (Payk.), *umbrosus* (Gyll.), *angustatus* Sturm, *melanarius* Sturm, *gyllenhalii* Sturm, *striola* (Gyll.), *erythrocephalus* (L.), *memnonius* Nic., **obscurus* Sturm.
Agabus †*affinis* (Payk.), **congener* (Thunb.), †*chalconatus* (Panz.) var. *melanocornis* Zimm.
Ilybius quadriguttatus (Lac.), †*aenescens* Thoms., C.G., *fenestratus* (Fabr.).
Copelatus haemorrhoidalis (Fabr.).
Rantus grapii (Gyll.), *bistriatus* (Bergstr.).
Dytiscus semisulcatus Muell., O.F., **circumflexus* Fabr., **circumcinctus* Ahr.
Acilius sulcatus (L.), *canaliculatus* (Nic.).
Agabus paludosus (Fabr.) (64). Golden Acre, Leeds, in a shallow, trickling stream over gravel, July, 1952; J.H.F. The only previous record from V.C. 64 is Knottingley, 1898.

Hydrophilidae

Limnebius **papposus* Muls.
Helophorus minutus Fabr.
Laccobius striatulus (Fabr.), *alutaceus* Thoms., C.G.
Helochares lividus (Forst.).
Enochrus testaceus (Fabr.), *ochropterus* (Marsh.).

Leiodidae

Agathidium laevigatum Er. *Spurn, W.D.H.

Staphylinidae

Sunius propinquus (Bris.) (*61). Spurn, 1 specimen in nest of mouse; W.O.S. The only other Yorkshire record is Yedingham flood-refuse (62); G.B.W.
Philonthus cruentatus (Gmel. in L.) (61). Spurn; W.O.S. A rare Yorkshire species, the only two earlier records being (61) Skipwith; W.D.H. and (62) Redcar; W.C.H.
P. quisquiliarius (Gyll.) (*61). Spurn; W.O.S. The only other Yorkshire records are (64) Adel; C.W.H.; and Askham Bog; W.D.H.
Gabrius splendidulus Grav. (62). Thornton-le-Dale, 1/8/53; A.M.R. Apparently widely distributed in Yorkshire, but by no means common.
Ocypus winkleri (Bernh.) (†61). Spurn, occasional; W.O.S.
O. globulifer (Fourcr.) (=*siculus* Stierl.) (61). Spurn, Welwick; W.O.S.
Ontholestes murinus (L.) (†61). Spurn, in dung and carrion, common; W.O.S.
Heterothops binotatus (Grav.) (61). Spurn, common. The only previous Yorkshire record is (61), "Banks of the Humber," *Steph., Ill.*, v, 257.
Quedius scintillans (Grav.) (*61). Spurn, 1 ex.; W.O.S.
Q. pallipes Lucas, H. (†61). Spurn, common in tidal refuse; W.O.S.
Q. obliteratus Er. (61). Spurn, common; W.O.S. Previously recorded for (61) from Breighton, 1913; W.J.F.
Q. semiobscurus (Marsh.)=*rufipes* (Grav.) (61). Spurn, common; only once recorded from (61) many years ago (T. Stainforth and H. E. Johnson).
Conosomus immaculatus Steph. (†61). Spurn, uncommon; W.O.S.; (62) taken by H. Britten, Jr., at Sleights, 2/10/37, but apparently the record was not published.
Lamprinodes saginatus (Grav.) (*61). Spurn, 1 ex.; W.O.S. Very rare in Yorkshire, recorded only from V.C. 62, Scarborough.
Tachyporus pallidus Sahlb. (*61). Spurn, not uncommon; W.O.S.
Oligota ytenensis Sharp (†61). Spurn, generally common.
O. atomaria Er. (*61). Spurn, uncommon; W.O.S. The only previous Yorkshire record is (62) Saltersgate; H.B.

Cilea silphoides (L.) (61). Spurn, common at times. According to the Victoria County History this is very common and widely distributed, but there are few records (V.C. 61, 62, 64), and these chiefly from V.C. 62.
Phytosus spinifer Curt. (*61). Spurn, rare; W.O.S. The only other Yorkshire records are from V.C. 62, Scarborough and Saltburn.
P. balticus Kraatz (*61). Spurn, occasional; W.O.S. (62) Scarborough; G.B.W.
Gnypeta rubrior Tott. (†61). Spurn, on mud, 1 ex.; W.O.S.
Amischa decipiens Sharp (61). Spurn, not uncommon; W.O.S. The only previous Yorkshire record is (61) Bubwith, flood-refuse; G.B.W.
Atheta (*Dacrila*) *fallax* (Kr.) (†61). Spurn, at times common; W.O.S.
A. (*Brundinia*) *marina* Muls. and Rey (†61). Spurn, with *A. meridionalis* (Muls. and Rey), but less common; W.O.S.
A. (*B.*) *meridionalis* (Muls. and Rey) (†61). Spurn, not uncommon in tidal refuse; W.O.S.
A. (*Philhygra*) *luridipennis* (Mann.) (*61). Spurn, rare; W.O.S.
A. (*P.*) *halophila* (Thoms., C.G.) (*61). Spurn, rare; W.O.S. The only other Yorkshire record is (62) Scarborough.
A. (*Microdota*) *indubia* Sharp (*61). Spurn, rare; W.O.S. Recorded only from (63) Askern; W. E. Sharp.
A. (*Halobrecta*) *algae* (Hardy) (†61). Spurn, common; W.O.S.
A. (*H.*) *flavipes* (Hardy) (*61). Spurn, common in seaweed and tidal refuse; Welwick, in salt marsh; W.O.S.
A. (*Tetropla*) *xanthopus* (Thoms., C.G.) (*61). Spurn, 1 ex.; W.O.S. Recorded only from (62) Glaisdale and Whitby; H.B.
A. (*Stethusa*) *pertyi* (Heer) (*61). Spurn, 1 ex.; W.O.S.
A. (*Dimetrota*) *setigera* (Sharp) (*61). Spurn, a few exs.; W.O.S.
A. (*D.*) *nigripes* (Thoms., C.G.) (*61). Spurn, not common; W.O.S.
A. (*Badura*) *ischnocera* Thoms., C.G. (†61). Spurn, not uncommon; W.O.S.
A. (*B.*) *macrocera* (Thoms., C.G.) (†61). Spurn, rare; W.O.S.
A. (*Datomicra*) *sordidula* Er. (61). Spurn, common in cowdung; W.O.S. (*62) Whitby, in decayed vegetation; H.B.
A. (*Coprothassa*) *melanaria* (Mann.) (*61). Spurn, a few; W.O.S. Recorded only from (62) Scarborough and Ravenscar.
A. (*Acrotona*) *parvula* (Mann.) (†61). Spurn, not uncommon; W.O.S.
A. (*A.*) *orbata* (Er.) (†61). Spurn, a few; W.O.S.
A. (*A.*) *clientula* (Er.) (*61). Spurn, common; W.O.S.
A. (*A.*) *laticollis* Steph. (*61). Spurn, occasional; W.O.S.
Meotica exilis (Er.) (61). Spurn, 1 ex.; W.O.S. Very local in Yorkshire.
Oxypoda (*Podoxya*) *brevicornis* (Steph.) (*61). Spurn, Welwick; W.O.S. Previously recorded only from (62) Scarborough and Arncliffe Wood.
O. (*Baeoglossa*) *exoleta* Er. (†61). Spurn, common at times; W.O.S.
O. (*Bessopora*) *haemorrhoa* (Mann.) (*61). Spurn, common; W.O.S.
O. (*B.*) *amoena* Fairm. and Lac. (†61). Spurn and Kilnsea, rare; W.O.S.
Microglotta gentilis (Maerk.) (†61). Spurn, rare; W.O.S.
M. nidicola (Fairm.) (*61). Spurn, very common; W.O.S. Recorded only from (63) Rossington and (64) Roundhay.
Aleochara bipustulata (L.) (*61). Spurn, very common; W.O.S.
A. (*Baryodma*) *intricata* Mann. (*61). Spurn, abundant; W.O.S. The only other Yorkshire record is (62) Whitby; H.B.
A. (*Homaeochara*) *sparsa* Heer (*61). Spurn, rare; Kilnsea, rare; W.O.S.
A. (*Rheochara*) *cuniculorum* Kr. (61). Spurn, not uncommon. The only other record is (61) Skipwith.
A. (*Emplenota*) *grisea* Kr. (*61). Spurn; W.O.S. Recorded only from (62) Saltburn and Redcar (M.L.T.).

Histeridae

Onthophilus striatus (Forst.) (64). Scarcroft, 20/5/53; H.M.R.
Saprinus virescens (Payk.) (*64). Woodhall Bridge, near Collingham, 25/5/53; H.M.R.

Cleridae

Necrobia violacea (L.) (62). Newton Dale, 17/4/53; A.M.R.
N. rufipes (De G.). With the last; A.M.R.

DERMESTIDAE

Attagenus pellio (L.) (64). Stainbeck Lane, Leeds, 22/5/53; H.M.R. Widely distributed in Yorkshire.

NITIDULIDAE

Kateretes bipustulatus (Payk.). (*61) Hornsea Mere, 18/7/52; H.M.R.

Carpophilus marginellus Motsch. (†63). Huddersfield. Taken by Mr. E. W. Aubrook in a white-worm culture (Enchytra) in August. Quite sudden in its appearance.

EROTYLIDAE

Triplax aenea (Schall.) (62). Newton Dale, 17/4/53; A.M.R.

LATHRIDIIDAE

Litargus connexus (Geoffr.) (64). Hazelwood Castle near Tadcaster, 2/3/52; H.M.R.

COCCINELLIDAE

Adonia variegata Muls. (62). Newton Dale, 17/4/53; A.M.R. An uncommon species in Yorkshire.

Anisosticta novemdecimpunctata (L.) (62). Very common near Throxenby Mere, Scarborough, in September, 1952-53; K.M.

Adalia bipunctata (L.) ab. *perplexa* Meier, formula 3, 1+2+6 (63) Barnsley; E.G.B. Apparently a rare form.

A. bipunctata (L.) ab. *gravea* (Hub.) (63). Barnsley; E.G.B.

Coccinella hieroglyphica L. (62). Ryedale, 27/6/53; H.M.R. (64) Moughton Fell, near Austwick, 6/6/53; H.M.R.

Propylea quattuordecimpunctata (L.). Forms 3+3; 5+6+6+5; 3+3, 5+6+6+5; 1+3+3, 5+6+6+5 have occurred in (63) the Barnsley area; E.G.B.

BOSTRICHIDAE

Dinoderus minutus (Fabr.) (62). Scarborough, December, 1952, 1 specimen in the house; A.M.R.

ANOBIIDAE

Ochina ptinoides (Marsh.) (*64). Bred from old ivy, Woodhall Bridge, near Collingham, 25/5/53; H.M.R. Previously recorded only from V.C. 62, Scarborough and Castle Howard.

Anobium punctatum (De G.). This seems to be spreading in the Scarborough area and is doing a good deal of damage in new buildings, especially in roof timbers.

RHIPIPHORIDAE

Metoecus paradoxus (L.) (62). West Ayton, August, 1953; A.M.R. (64) Scarcroft, near Leeds, 27/8/52; H.M.R.

LAGRIIDAE

Lagria hirta (L.) (62). Forge Valley, July, 1951; A.M.R.

TENEBRIONIDAE

Phylan gibbus (Fabr.) (*62). Cayton Bay, 1 specimen, August, 1951; A.M.R.

Scaphidema metallicum (Fabr.) (64). Towton Woods, near Tadcaster, 2/3/52; H.M.R.

Hypophloeus bicolor (Ol.) (62). Forge Valley, under elm bark, 15/4/53; A.M.R.

SCARABAEIDAE

Aegialia arenaria (Fabr.) (62). Cayton Bay, June, 1951; A.M.R.

Cetonia aurata (L.) (62). West Ayton, June, 1952; A.M.R.

CERAMBYCIDAE

Asemum striatum (L.) (62). Cloughton, August, 1951; A.M.R. Newton Dale, July, 1953; A.M.R. This beetle is extending its range in V.C. 62, probably as a result of afforestation. It has not yet been recorded from elsewhere in Yorkshire.

Strangalia quadrifasciata (L.) (62). Thornton-le-Dale, 1 specimen, 8/51; A.M.R.
S. melananura (L.) (62). Forge Valley, July, 1950; A.M.R.
Molorchus minor (L.) (64). Bred from larva in Bramham Park near Leeds; W.D.H. (*Nat.*, 1952, 110).
Pogonocherus hispidulus (Pill. and Mitt.) (62). Wykeham, June, 1949; A.M.R.
P. fasciculatus (De G.) (*64). Scarcroft, near Leeds, 6/53; H.M.R.
Saperda populnea (L.) (64). Brotherton, M. D. Barham (*fide* J.H.F.).
S. carcharias (L.) (62). Hackness, 10/7/51, 1 specimen; A.M.R., conf. G. B. W. Fowler's record, Crosscliff, *Brit. Col.*, IV, 252, is an error.
S. scalaris (L.) (62). Levisham, June, 1953; M. D. Barham, conft. J.H.F. All the Yorkshire records for this species are from V.C. 62.

Chrysomelidae

Chrysolina fastuosa (Scop.) (63). Halifax district, *fide* W.D.H.
C. menthastri (Suffr.). This record should be deleted as the identification was in error.
Galerucella nymphaeae (L.) (62). West Ayton, July, 1951; A.M.R.

Platystomidae

Brachytarsus nebulosus (Forst.) (64). Askham Bog, 16/5/52; H.M.R.

Curculionidae

Rhinomacer attlaboides Fabr. (62). Thornton-le-Dale, August, 1951; A.M.R.
Caenorhinus aequatus (L.) (*64). Wykeham, July, 1952; A.M.R. The only other Yorkshire records are Hooton Pagnell and Askham Bryan, both of very long standing.
Otiorrhynchus nodosus (Muell., O.F.) (62). West Ayton, 22/9/53; A.M.R. Recorded from (62) Scarborough, R.L.; and from (64) Beamsley Beacon; J.H.F.
Barypithes araneiformis (Schrank) (62). Cayton Bay, 1950; A.M.R.
B. pellucidus (Boh.) (62). Forge Valley; A.M.R. A rare species in Yorkshire.
Euophryum rufum Broun (†64). Two specimens from decayed oak logs, Leeds, 4/4/52; H.M.R. Two, 4/1/53; D. W. Whitehead.
Dorytomus filirostris Gyll. (†64). Barlow; T.B.K. Previously found in the British Isles only in a very restricted locality near Wicken Fen (*Ent. mon. Mag.*, 1947, p. 52).
Cryptorhynchidius lapathi (L.) (64). Brotherton, June, 1953; M.D.B.
Rhinoncus pericarpius (L.) (62). Raincliffe Wood, August, 1952; A.M.R.

Scolytidae

Scolytus scolytus (Fabr.) (62). Wykeham, August, 1951; A.M.R.
S. mali (Bechst.) (*64). Scarcroft, near Leeds, 6/5/51; H.M.R.
Hylesinus crenatus (Fabr.) (62). West Ayton, July, 1951; A.M.R.
Cryphalus abietis Er. (62). Harwood Dale, July, 1951; A.M.R.
Anisandrus saxeseni (Ratz.) (*62). Broxa, July, 1951, Langdale End, July, 1950; A.M.R.

Diptera (K. G. Payne): October is much too early for a relative beginner in the study of Diptera to report upon the material collected during the previous summer months. The few following notes comprise only some of the species taken at the two Union Meetings the writer was able to attend and a few notes on other field work during 1953.

At the Helmsley Meeting on June 27th conditions were not very good for collecting flies and the number of species taken was rather small. Collecting on the river bank near Ashberry Farm, the most interesting species taken were the tipulids *Hexatoma fuscipennis* Curtis, usually associated with fast-running streams, and *Clusiodes albimana* Mg., one of a small family of flies, the larvae of some of which are known to live in rotten wood. Among the other species taken were:

Beris geniculata Curtis, *B. vallata* Forster, *Dolichopus claviger* (Stannius), *D. popularis* Wied., *D. ungulatus* Lw., *Sciopus platypterus* (Fabr.), *Dryomyza decrepita* Zett., *Sciomyza dubia* Fln.

The rest of the collecting was done in the lower part of Quarry Bank Wood and *S. albocostata* Fln. and *Helomyza similis* Mg. were among the species taken here.

The North Cave Meeting was blessed with warm and mainly sunny weather and was very interesting from the point of view of Diptera. Collecting was from the following localities, (1) a well-vegetated flowery lane on sandy soil at Dryham, (2) a pond in a field corner between Dryham and Hotham Carr, and (3) Hotham Carr. The more prominent of the flies from these localities so far determined are as follows:

(1) *Tipula unca* Wied., *Nephrotoma quadrifaria* Mg., *Nemotelus nigrinus* Fln., *Microchrysa polita* L., *Machimus atricapillus* Fln., *Dioctria baumhaueri* Mg., *Chrysopilus cristatus* (Fabr.), *Sicus ferrugineus* L., *Sphenella marginata* Fln., *Paroxyna parvula* Lw., *Xyphosia miliaria* Schrank, *Urophora jaceana* Hering, *Trypeta tussilaginis* (Fabr.), *Tytos corrigiolatus* (L.), *Sciopus* sp. ♀ (either *loewii* (Becker) = *contristans* (Wied.), or *maritimus* Becker), *Rhinophora lepida* Mg.

(2) *Chelifera* sp. ♀ (belonging to the *praecatoria* group of species with a rounded blackish stigma, but the males only are distinguishable by hypopygial characters). *Dolichopus longicornis* Stan., *Hercostomus germanus* (Wied.), *Hydrina punctatonervosa* Fln.

(3) *Prionocera turcica* Fabr., *Dolichopus vitripennis* Mg., *Anepsiomyia flaviventris* Mg., *Ctenulus distinctus* (Mg.), *Dichaetophora obliterata* (Fabr.), *Hydromyia dorsalis* (Fabr.), *Ilione* (= *Elgiva*) *albiseta* (Scop.).

Tylos corrigiolatus (L.) is a most remarkable looking fly with relatively long legs and short wings and looks rather un-flylike resting on leaves. The trypetid *Sphenella marginata*, associated with ragwort species, has been little recorded in Yorkshire, but is common at Spurn. The mines of *Paroxyna parvula* were plentiful in the leaves of *Artemesia* at Dryham. It is common at Spurn, the records from the other vice-counties being mainly from river banks. *Sciopus maritimus* was recorded from Skipwith by Mr. Cheetham. *Rhinophora lepida* Mg. is a common and very distinctive blackish-winged tachinid fly stated to be parasitic on the woodlouse *Porcellio scaber* Latr.

The distinctive little dolichopod *Anepsiomyia* seems to have been recorded mainly from the south of England, but probably has often been overlooked owing to its small size. It may be suspected that Hotham Carr is a very interesting spot which would repay much further study. In view of the rich insect fauna known at Spurn and the richness of the Barmby Moor area shown by the work of the late Dr. Fordham, it is reasonable to suppose that suitable areas in between, and farther north and west across the Plain of York, may share in the richness.

On the whole, 1953 seems to have been a poor one for flies. As far as the York area is concerned none of the large tipulids seems to have been up to the number of the previous two or three years. The small number of *Tipula lunata* L.—usually an abundant species about Copmanthorpe—was especially noticeable, but the relative scarcity extended to most of the species of the open fields and roadsides. Only a dozen or two specimens of *Empis chioptera* Mg. could be found early in the year on the blossom of fruit trees where the numbers in 1952 were measured in hundreds. Throughout the year there has not been one night when flies (especially Tipulidae, Chironomidae, Psychodidae, Mycetophilidae and Sphaeroceridae) have come in thousands to the house lights after dark, as they have on many nights in recent years. Consequently relatively few have been taken inside the windows in daylight. The scarcity has continued till the autumn. Not one specimen of *Tipula pagana* Mg. has been seen round the house, Phoridae have been scarce, running on the windows and the allied Sphaeroceridae species *Copromyza* (= *Trichiaspis*) *equina* (Fln.) and *similis* Collin, swarming to lighted windows in hundreds in October, 1951, have not been seen.

The infrequently recorded syrphids *Criorhina asilica* Fln. and *C. berberina* Fabr. were taken at may blossom at Askham Bog on April 25th. Individuals of one or both of the species were flying slowly in and out among the leaves and branches with a steady flight—not the darting frequently seen among syrphids. The specimen of *C. berberina* had been captured by a male *Empis tesselata*. *Beris morrisii* Dale was there with the commoner *B. chalybeata* Forster. Three very distinctive and readily identified *Rhamphomyia* species were taken at Askham Bog; *R. tibiella* Zett. on May 25th, *R. geniculata* Mg. on May 30th, and *R. barbata* Macq. on June 6th. On the last date most of two hours sweeping were necessary to produce three specimens of *Cordylura umbrosa* Lw., and one of *C. pubera* L., so presumably they were scarce.

A male of *Platystoma seminationis* (L.) was taken on May 31st, when sweeping a drainside on Acaster Ings (V.C. 64). *Empis grisea* Fln. and the extraordinary *Rhamphomyia dentipes* Zett. were there together with an abundance of the common yellow *Empis stercorea* L. and *E. punctata* Mg., and *Scopeuma suillum* Fabr. *Beris clavipes* L., the less common of the two yellow *Beris* species, was in abundance by a ditch of stagnant water at Acaster on May 25th. Much later in the year, on July 19th, 9 males and 15 females of *Rhamphomyia sciarina* (Fln.) (the *R. hybrida* Zett. of Lundbeck and the earlier British lists) were taken by this ditch. The species is unusual in that the bodies of the males are almost all black with blackish wings, while the females are yellow.

A visit to Pond Head (near Yearsley, V.C. 62) on July 17th showed *Tipula fulvipennis* Degeer to be in some numbers about the alder swamp at the upper end. *Sciara thomae* (L.) was plentiful about the dam and a male of *Dolichopus picipes* Mg. was taken. This is one of the few Dolichopus species having legs and postocular cilia almost entirely black. It does not seem to have been recorded in Yorkshire since listed by Grimshaw in the Victoria County History.

A male of *Limnobia quadrinotata* Mg. appeared in the house (Copmanthorpe) on September 5th.

On October 3rd a visit was paid to East Baugh Fell, whose summit reaches 2,216 ft. O.D. and, owing to its flatness, provides more than a square mile of land over 2,000 ft. O.D. Conditions were not good for collecting flies (as so often on the fells) with a moderate and cool breeze and the vegetation very wet from previous rain, but 18 species of flies were taken in rather over four hours, mainly by tubing them from the surfaces of pools of water. A single specimen of *Ectomus alpinus* (Haliday) was taken running on a slope of exposed peat near a tarn at about 2,100 ft. O.D. Previous Yorkshire records are by Mr. Cheetham and the late Dr. Edwards from Ingleborough and a single one by Mr. Cheetham from Robin Hood's Bay. The species is stated to favour heathy country such as the New Forest in the south and in France, but has not been taken on the Lowland Heaths in Yorkshire. This Baugh Fell material has not yet been worked over, but includes a *Trichocera*, the ubiquitous *Anisopus* (=*Rhyphus*) *punctatus* (Fabr.), several Chironomidae species, five Mycetophilidae species (apart from Sciarinae, which were present but not collected), three Ephydridae species and representatives of Sphaeroceridae and Cordyluridae. Some parasitic hymenoptera were present on the surface of pools with the flies.

C. A. Cheetham adds: The year has been disappointing for most insects, the variable weather may be partly the cause. The drought in April and May probably killed many soil-dwelling larvae. This year *Atherix ibis* Fal. was taken by H. M. Russell at Collingham and Helmsley and I had it at Grinton where the uncommon *Peronecera fuscipennis* Curt. was in plenty. K. G. Payne has done good work at Spurn and we hope to see a note on his collecting on East Baugh Fell. This year *Sericomyia borealis* Fln., so plentiful last year, has been replaced by *S. lappona* L., *Catabomba selenitica* Mg. has been plentiful. On Sulber Nick I found a number of *Tipula melanoceros* Schum., much smaller than normal. We find a variation in size in *T. luteipennis* Mg., but not usually in *melanoceros*. Amongst Tipulids taken at North Cave, the common marsh *Prionocera turcica* Fab. was much darker than normal and might have been *P. subserricornis* Zett., except for the genitalia. These two variations may be due to the weather.

Trichoptera, Plecoptera, Ephemeroptera (C. A. Cheetham): These insects have been more plentiful than the Diptera and Lepidoptera this season. Little has been published regarding their time of flight.

The first Caddis seen at Austwick was *Rhyacophila dorsalis* Curt., May 3rd, but this species was not seen again until its normal date of August. *Sericostoma personatum* Spence and *Agapetus fuscipes* Curt. were seen at the end of May and were joined in early June by *Odontocerum albicorne* Scop. and *Polycentropus flavomaculatum* Pict.; these continued into August. Two species of *Tinodes*, *dives* Pict., *waeneri* L. and *Psychomyia pusilla* F. were also found at this time. It was September before *Halesus auricollis* Pict. became very plentiful along with a few *H. guttatipennis* McLach. and *H. radiatus* Curt. These are still with us at the end of October.

The Stoneflies were fairly plentiful starting with *Protonemura meyeri* Pict., *Taenopteryx nebulosa* L. and *Leuctra hippopus* Kemp. in March. The Yellow Sallies,

Chloroperla torrentium Pict. and *Isoperla grammatica* Poda were much scarcer than in previous years, occurring at the end of May.

The first Mayfly noted was *Baetis rhodani* Pict., March 5th, and *B. pumilus* Burm., March 23rd, these being seen until October. The well-known Mayfly, *Ephemera danica* Müll., appeared May 30th, and was in fair numbers but less plentiful than in previous years. Odd specimens occurred into September, which is very unusual.

Plant Galls (E. F. Gilmour): Whilst I myself have, due to pressure of other work, been unable to find time for much field work this year, numerous specimens have been sent to me for examination. Galls caused by 97 different identified agents on 55 different host plants are recorded in this year's report. Grateful thanks are due to correspondents who have sent in material, special thanks being due to Miss C. M. Rob of Thirsk, who, during her botany expeditions has this year collected all the Plant Galls that she has seen in various parts of the country and sent them to me in large numbers. Miss Rob's specimens make the bulk of the list for 1953. Mr. W. Bunting has also sent a fair number of specimens collected in the Thorne area, and Mr. W. D. Hincks has sent a list of scattered records. Thanks are also due to Mr. R. B. Benson of the British Museum (Nat. Hist.) for his assistance in identifying, checking or confirming several specimens of whose identity I was doubtful.

Galls from other parts of Yorkshire would also be welcome during next season. Botanists in particular are likely to find specimens and if these could be sent to me, with localities and preferably the name of the plant, at the Art Gallery and Museum, Waterdale, Doncaster, I would be very grateful.

The initials in the following list stand for the following persons: R. B. Benson (R.B.B.), W. Bunting (W.B.), E. F. Gilmour (E.F.G.), Dr. R. W. Harper (R.W.H.), W. D. Hincks (W.D.H.), T. B. Kitchen (T.B.K.), Miss C. M. Rob (C.M.R.), Miss C. Shaddick (C.S.).

	Agent	*Plant*
Lepidoptera	*Mompha decorella* (Stephens) (63). Thorne, 14/7/53; W.B.	*Epilobium hirsutum* Linn.
Coleoptera	*Saperda populnea* (Linn.) (61). Skipwith, 1/9/53; W.D.H.	*Populus tremula* Linn.
	Apion sp. (? *assimile* Kirby) (62). Catton, 6/8/53; C.M.R.	*Trifolium pratense* Linn.
	Apion sp. (? *frumentarium* Linn.) (63). Thorne, 11/6/53; W.B.	*Rumex acetosella* Linn.
Hymenoptera	*Dolerus cothurnatus* Lepel. (64). Askham Bog, 12/7/53; E.B.B.	*Equisetum fluviatile* Linn.?
	Blennocampa pusilla (Klug) (64). Askham Bog, 12/7/53; E.B.B. and E.F.G.	*Rosa canina* Linn.
	Pontania proxima (Lepel.) (62). Castle Howard, -/8/53; C.M.R. 2/9/53; W.D.H. (65). Hawgrave, -/8/53; C.M.R.	*Salix fragilis* Linn.
	P. proxima (Lepel.) (61). Allerthorpe, 31/8/53; W.D.H. Skipwith, 1/9/53; W.D.H.	*Salix caprea* Linn.
	P. proxima (Lepel.) (63). Thorne, 7/5/53; W.B.	*Salix* sp. (? *alba* Linn.).
	P. proxima (Lepel.) (62). Strensall, 24/6/53; E.F.G.	*Salix atrocinerea* Brot. ?
	P. femoralis (Cameron) (63). Thorne, 12/6/53; W.B.	*Salix purpurea* Linn.
	P. pedunculi (Hartig.) (64). Askam Bog, 12/7/53; E.B.B.	*Salix atrocinerea* Brot.
	P. bridgmanii (Cameron) (64). Askham Bog, 12/7/53; E.B.B. and E.F.G.	*Salix atrocinerea* Brot.

	Agent	*Plant*
HYMENOPTERA (*cont.*)	*Pontania bridgmanii* (Cameron) (61). Allerthorpe, 31/8/53; W.D.H. Skipwith, 1/9/53; W.D.H.	*Salix caprea* Linn.
	P. bridgmanii (Cameron) (62). Silpho, 12/9/53; W.D.H. Forge Valley, 15/9/53; W.D.H. Throxenby Mere, 15/9/53; W.D.H.	*Salix* sp. ?
	Pontania sp. ? (62). Duncombe Park Helmsley, 27/6/53; C.M.R.	*Tilia platyphylla* Scop.
	Pteronidea salicis (Linn.) (62). Pilmoor, –/9/53; C.M.R.	*Salix repens* Linn.
	P. salicis (Linn.) (65). Aysgarth, –/8/53; C.M.R. Marsett, –/8/53; C.M.R.	*Salix purpurea* Linn.
	Euura amerinae Linn. (64). Burton Leonard, –/7/53; C.S.	*Salix pentandra* Linn.
	Rhodites eglanteriae Hartig. (62). Yearsley, –/9/53; C.M.R. Pilmoor, –/9/53; C.M.R.	*Rosa canina* Linn.
	R. eglanteriae Hartig. (61). Allerthorpe, 31/8/53; W.D.H. Skipwith, 1/9/53; W.D.H. (62) Scarborough district, 12-15/9/53; W.D.H.	*Rosa* sp. ?
	R. rosae (Linn.) (62). Yearsley, –/9/53; C.M.R.	*Rosa canina* Linn.
	R. rosae (Linn.) (61). Skipwith, 1/9/53; W.D.H. (62) Scarborough district, 12-15/9/53; W.D.H.	*Rosa* sp. ?
	R. spinosissimae Giraud (64). Burton Leonard, –/7/53; C.S.	*Rosa spinosissima* Linn.
	Aylax papaveris (Perris) (62). Catton, –/9/53; C.M.R.	*Papaver dubium* Linn.
	Liposthenus latreillei (Kieffer) (63). Thorne, 3/6/53; W.B. Thorne Moor, 30/6/53; W.B.	*Nepeta hederacea* Linn.
	Aulacidea hieracii (Bouché) (63). Canal Bank, Luddendenfoot, near Halifax, –/9/53; C.M.R.	*Hieraceum perpropinquum* (Zahn) Pugsl.
	Biorhiza pallida (Olivier) (61). Skipwith, 1/9/53; W.D.H. (62). Pilmoor, -/8/53; C.M.R. Catton, -/8/53; C.M.R.	*Quercus robur* Linn.
	Andricus kollari (Hartig.) (61). Allerthorpe, 31/8/53; W.D.H. Skipwith, 1/9/53; W.D.H. (62) Scarborough district, 12-15/9/53; W.D.H.	*Quercus robur* Linn.
	A. ostreus (Hartig.) (61) Skipwith, 1/9/53; W.D.H. Breighton, 1/9/35; W.D.H. (62) Catton, -/8/53; C.M.R. Scarborough district, 12-15/9/53; W.D.H.	*Quercus robur* Linn.
	A. fecundator Hartig. (61). Allerthorpe, 31/8/53; W.D.H. Skipwith, 1/9/53; W.D.H. (62) Scarborough district, 12-15/9/53; W.D.H.	*Quercus robur* Linn.
	A. curvator Hartig. (61). Allerthorpe, 31/8/53; W.D.H.	*Quercus robur* Linn.
	Cynips divisa Hartig. (61). Allerthorpe, 31/8/53; W.D.H. Skipwith, 1/9/53; W.D.H. (62) Raincliffe Woods, 15/9/53; W.D.H.	*Quercus robur* Linn.

	Agent	*Plant*
HYMENOPTERA (*cont.*)	*Cynips divisa* Hartig form. *verrucosa* (Schlecht) (63). Thorne, 12/6/53; W.B.	*Quercus robur* Linn.
	C. quercus-folii Linn. (61). Skipwith, 1/9/53; W.D.H.	*Quercus robur* Linn.
	Neuroterus quercus-baccarum form *lenticularis* (Olivier) (61). Allerthorpe, 31/8/53; W.D.H. Skipwith, 1/9/53; W.D.H. Breighton, 1/9/53. (62) Pilmoor, –/8/53; C.M.R. Catton, -/8/53; C.M.R. Yearsley, -/9/53; C.M.R. Silpho Moor, 12/9/53; W.D.H. Forge Valley, 15/9/53; W.D.H. (63) Doncaster, 21/8/53; E.F.G.	*Quercus robur* Linn.
	N. numismalis (Geoffroy) (61). Skipwith, 1/9/53; W.D.H. (62) Forge Valley and Raincliffe Wood, 15/9/53; W.D.H.	*Quercus robur* Linn.
DIPTERA	*Lasioptera rubi* Heeger (62). Near Strensall, 24/6/53; E.F.G.	*Rubus plicatus* Weihe and Nees (*fruticosus* Linn.).
	Rhabdophaga terminalis (Loew) (62). Strensall, 24/6/53; E.F.G.	*Salix fragilis* Linn.
	Dasyneura fraxini (Kieffer) (64). Foxup, 18/8/53; C.M.R. How Stean, 29/8/53; C.M.R. (65), Tanfield, -/8/53; C.M.R.	*Fraxinus excelsior* Linn.
	D. ulmariae (Bremi-Wolf) (61). Breighton, 1/9/53; W.D.H. (62) Ashberry, near Rievaulx, 27/6/53; C.M.R. (63) Thorne, 12/6/53; W.B. (64) Askham Bog, 12/7/53; E.F.G.	*Filipendula ulmaria* (Linn. Maxim.
	D. ulmariae (Bremi-Wolf) (62). Strensall, 24/6/53; E.F.G.	*Filipendula vulgaris* Moench.
	D. plicatrix (Loew) (61). Skipwith, 1/9/53; W.D.H.	*Rubus* sp. ?
	D. aparine (Kieffer) (63). Thorne Moor, 30/6/53, 14/7/53; W.B.	*Galium aparine* Linn.
	D. urticae (Perris) (62). Ravenscar, 13/9/53; W.D.H.	*Urtica dioica* Linn.
	D. ranunculi (Bremi-Wolf) (63). Thorne, 9/7/53; W.B.	*Ranunculus repens* Linn.
	D. crataegi (Winnertz) (61). Allerthorpe, 31/8/53; W.D.H. Skipwith, 1/9/53; W.D.H. (62) Castle Howard, 2/9/53; W.D.H. Scarborough district, 12-15/9/53; W.D.H. (63) Thorne, 14/7/53; W.B. (65) Norton, -/8/53; C.M.R.	*Crataegus monogyna* Jacq.
	Jaapiella veronicae (Vallot) (62). Catton, 6/7/53; C.M.R. Rievaulx, –/8/53; C.M.R. Near Wykeham, 12/9/53; W.D.H. (64) Foxup, 18/8/53; C.M.R. How Stean, 29/8/53; C.M.R.	*Veronica chamaedrys* Linn.
	Cystiphora sonchi (Loew) (63). Thorne, 12/6/53; W.B.	*Sonchus arvensis* Linn.
	Wachtliella persicariae (Linn.) (62). Castle Howard, –/8/53; C.M.R. Warthill, 2/9/53; W.D.H.	*Polygonum amphibium* Linn.
	Mikiola fagi (Hartig.) (62). Castle Howard, 2/9/53; W.D.H. Raincliffe Woods, 15/9/53; W.D.H.	*Fagus sylvatica* Linn.

	Agent	*Plant*
DIPTERA (*cont.*)	*Didymomyia reaumuriana* (Loew) (62). Dunscombe Park, near Helmsley, 27/6/53; C.M.R.	*Tilia platyphylla* Scop.
	Rondaniola bursaria (Bremi-Wolf) (62.) Catton, –/8/53; C.M.R.	*Glechoma hederacea* Linn.
	Iteomyia capreae (Winnertz) (62). Pilmoor, –/9/53; C.M.R. Yearsley, –/9/53; C.M.R.	*Salix atrocinerea* Brot.
	I. capreae (Winnertz) (61). Allerthorpe, 31/8/53; W.D.H. Skipwith, 1/9/53; W.D.H. (62) Castle Howard, 2/9/53; W.D.H. Scarborough district, 12-15/9/53.	*Salix caprea* Linn.
	Contarinia betulina (Kieffer) (63). Thorne, 14/7/53; W.B.	*Betula verrucosa* Ehrh.
	C. helianthemi (Hardy) (62). Ashbury, near Rievaulx, 18/8/53; C.M.R.	*Helianthemum chamaecistus* Mill.
	Harmandia tremulae (Winnertz) (61). Skipwith, 1/9/53; W.D.H.	*Populus tremula* Linn.
	Clinodiplosis thalictricola Rüb. (64). Askham Bog, 12/7/53; E.F.G. (det. E.B.B.).	*Thalictrum flavum* Linn.
	Macrodiplosis dryobia (Loew) (62). Strensall, 24/6/53; E.F.G. Rievaulx, 27/6/53; C.M.R.	*Quercus robur* Linn.
	Urophora jaciana (Hering) (61). Skipwith, 1/9/53; W.D.H. (62) Scarborough, 12-15/9/53; W.D.H.	*Centaurea nigra* Linn.
	Lipara lucens Meigen (64). Askham Bog, 12/7/53; E.F.G.	*Phragmites communis* Trin.
	Pegohylemyia signata (Brischke) (63). Thorne, 14/8/53; W.B.	*Dryopteris spinulosa* (Müll.).
	? sp. (Dipterous larvae in deformed flower-heads.) (64). Askham Bog, 12/7/53; E.F.G.	*Solanum dulcamara* Linn.
HOMOPTERA	*Livia juncorum* (Latreille) (63). Thorne, 13/7/53; W.B. Thorne, 14/7/53; R.W.H.	*Juncus squarrosus* Linn.
	Psyllopsis fraxini (Linn.) (62) Near Rievaulx, 27/6/53; C.M.R. (64) Foxup, 18/10/53; C.M.R.	*Fraxinus excelsior* Linn.
	Acyrthosiphon (*Microlophium*) *carnosum* Buckton (?=*urticae* Fabr.) (63). Thorne, 13/7/53; W.B. (?=*Trioza urticae* Linn.).	*Urtica dioica* Linn.
	Cryptomyzus ribis (Linn.) (61). Howden, 7/7/53; T.B.K. 1/9/53; W.D.H.	*Ribes sanguineum* Linn.
	Bevicoryne brassicae (Linn.) (65). Aysgarth, -/8/53; C.M.R.	*Capsella bursa-pastoris* (Linn.) Medic.
	Rhopalosiphum crategellum (Theobald) (63). Thorne, 13/7/53; W.B.	*Crataegus monogyna* Jacq.
	Yezabura sorbi (Kaltenb.) (63). Doncaster, –/8/53; E.F.G.	*Sorbus aucuparia* Linn.
	Myzocallis annulatus (Hartig.) (63). Thorne, 14/7/53; W.B.	*Quercus robur* Linn.
	Eriosoma ulmi (Linn.) (63). Thorne Moor, 30/6/53; W.B.	*Ulmus glabra* Huds., subsp. *montana* (Stokes) Lindquist.
	E. ulmi (Linn.) (63). Thorne Moor, 30/6/53; W.B.	*Ulmus procera* Sahlb.

	Agent	*Plant*
HOMOPTERA (*cont.*)	*Tetraneura ulmifoliae* Baker (63). Thorne Moor, 30/6/53; W.B.	*Ulmus procera* Salisb.
	Aphis (?) sp. ? (64). Halton Gill, 18/8/53; C.M.R.	*Trifolium pratense* Linn. (var. cult.).
ACARI	*Eriophyes pyri* Pagenst. (61). Allerthorpe, 1/9/53; W.D.H. (62) Silpho Moor, 12/9/53; W.D.H.	*Sorbus aucuparia* Linn.
	E. pyri Pagenst. var. *variolata* Nalepa (62). Rievaulx, –/9/53; C.M.R.	*Sorbus intermedia* (Ehrh.) Pers.
	E. pyri Pagenst. var. *variolata* Nelepa (62). Pilmoor, –/8/53; C.M.R. Strensall, 24/6/53; E.F.G. (63) Thorne, 24/6/53; W.B.	*Sorbus aucuparia* Linn.
	E. padi Nalepa (64). How Stean, 29/8/53; C.M.R.	*Prunus padus* Linn.
	E. tetanothrix Nalepa (64). How Stean, 29/8/53; C.M.R.	*Salix caprea* Linn.
	E. goniothorax Nalepa (62). Ashberry, near Rievaulx, 18/8/53; C.M.R. (64) Foxup, 18/8/53; C.M.R.	*Crataegus monogyna* Jacq.
	E. laevis Nalepa (62). Sutton-on-Forest, 24/6/53; E.F.G. How Stean, 29/8/53; C.M.R. Rievaulx Bridge, 27/6/53; C.M.R. Castle Howard, 2/9/53; W.D.H. Scarborough district, 12-15/9/53; W.D.H. (63) Thorne, 13/7/53; W.B.	*Alnus glutinosa* (L.) Gaertn.
	E. laevis Nalepa var. *inangulis* Nalepa (62). Castle Howard, 2/9/53; W.D.H. Scarborough district, 12-15/9/53; W.D.H.	*Alnus glutinosa* (L.) Gaertn.
	E. macrochelus Nalepa (62). Near Rievaulx, 27/6/53; C.M.R. (63) Sykehouse, 25/9/53; W.B.	*Acer campestre* Linn.
	E. macrorrhynchus Nalepa. (62). Catton, –/8/53; C.M.R. (63) Thorne Moor, 30/6/53; W.B.	*Acer pseudoplatanus* Linn.
	E. macrorrhynchus Nalepa (62). Ashberry, near Rievaulx, 27/6/53; C.M.R.	*Acer campestre* Linn.
	E. brevitarsus Focken (62). Rievaulx Bridge, 27/6/53; C.M.R. Forge Valley, 15/9/53; W.D.H.	*Alnus glutinosa* (L.) Gaertn.
	E. avellanae Nalepa (62). Ashberry, near Rievaulx, 27/6/53; C.M.R. (64) How Stean, 29/8/53; C.M.R.	*Corylus avellana* Linn.
	E. similis Nalepa (61) Allerthorpe, 31/8/53; W.D.H. (62) Ashberry, near Rievaulx, 27/6/53, 18/8/53; C.M.R.	*Prunus spinosa* Linn.
	E. galii Karp. (62). Ashberry, near Rievaulx, 27/6/53; C.M.R. Pilmoor, –/8/53; C.M.R.	*Galium aparine* Linn.
	E. tiliae Nalepa var. *liosoma* Nalepa W.H.D. (62). Castle Howard, 2/9/53;	*Tilia vulgaris* Hayne.
	E. tristriatus Nalepa, var. *erinea* Nalepa (61). Howden, 7/7/53; T.B.K.	*Juglans regia* Linn.
	E. nalepai Focken (62) Yearsley, -/9/53; C.M.R. (64) Askham Bog, 12/7/53; E.F.G.	*Alnus glutinosa* (L.) Gaertn.

	Agent	*Plant*
AGARI (*cont.*)	*E. nalepai* Focken (64). Askham Bog, 12/7/53; E.F.G. (62) Yearsley, –/9/53; C.M.R.	*Alnus glutinosa* (L.) Gaertn.
	E. thomasi Nalepa (62). Ashberry, near Rievaulx, 18/8/53; C.M.R.	*Thymus serpyllum* Linn.
	E. anceps Nalepa? (62). Rievaulx, –/18/53; C.M.R.	*Veronica chamaedrys* Linn.
	E. truncatus Nalepa? (64). Askham Bog, 12/7/53; E.F.G.	*Salix purpurea* Linn. ?
	Phyllocoptes acericola Nalepa (64). Foxup, Lettondale, 18/8/53; C.M.R.	*Acer pseudoplatanus* Linn.
FUNGI	*Epichloe typhina* Persoon. (65). Aysgarth, –/8/53; C.M.R.	*Deschampsia caespitosa* (L.) Beauv.
	Puccinia aegopodii Schum. (62). Catton, –/8/53; C.M.R.	*Aegopodium podagraria* Linn.
	P. caricis Schüm. ? (or near ?), (? *Polycistis*) (62). Ashberry, near Rievaulx, 27/6/53; C.M.R.	*Filipendula ulmaria* (L.) Maxim.
	Puccinia sp. (? *saniculae* Grev. or *aegopodii* Schüm.) (on leaves). (62). Ashberry, near Rievaulx, 27/6/53; C.M.R.	*Aegopodium podagraria* Linn.
	Taphrina aurea Fries. (62). Castle Howard, 2/9/53; W.D.H.	*Populus* sp.
	T. sadebeckii Johans. ? (62). Yearsley, –/9/53; C.M.R.	*Alnus glutinosa* (L.) Gaertn.
	T. bullata Tulasne ? (62). Rievaulx, 27/6/53; C.M.R.	*Crataegus monogyna* Jacq.
	Coniothyrium tumaefaciens Güss (62). Ashberry, near Rievaulx, 18/8/53; C.M.R.	*Rubus fruticosus* Linn.
	Urocystis anemone Persoon. (62). Rievaulx, 27/6/53; C.M.R.	*Ranunculus acris* Linn.
	Protomyces macrosporus Unger ? (63). Thorne, 14/7/53; W.B.	*Apium nodiflorum* (L.). Lag.
	Ustilago sp. (? *bistortarum* DC.) (63). Thorne, 9/7/53; W.B.	*Polygonum amphibium* Linn.

BOTANY

(Chris. A. Cheetham).—The weather has again given an interesting year's vegetational growth. In many ways it has been like 1952 but the spring drought came later (February 23th to March 25th). The effect of the weather on the fruiting of the trees resulted in the Ash having one of its very rare displays of fine and abundant ' keys '. The Hazel was full of nuts and the Rowan carried a wonderful show of crimson fruit bunches. During the first half of the year the rainfall was very low and plant growth was held up, but when July brought a rainy period it resulted in a growth of vegetation in cases to twice the normal height of the plants. A similar thing was seen in 1952 but in less degree. Another feature was a series of extensive flowering displays for short periods on various plants. In early March this was noted on Celandine, Dandelion and Daisy, and in April with the Primroses, Violets and Marsh Marigolds. In early May the Spring Potentilla flowered abundantly in its usual restricted habitat and spread over into the higher portion of Feizor Wood and Austwick Wood. The Bugle was striking, possibly due to its abnormal growth. The Harebell came into bloom early and kept on flowering for a long time. Rock Roses flowered well as did the Crosswort, Bedstraw and the Great Valerian. Plants that suffered from the early drought were the Orchids and damp-loving plants in places that got dried out. Grass of Parnassus suffered in some stations. On Austwick Moss the damp Sphagnum areas helped its associates, Bog Asphodel, Bog Andromeda and Cranberry but, after a fine show of bloom, the Cranberry gave a poor crop of berries, very different from the fruit on the Brambles. The baked

soil evidently held up the growth of many species of fungi and many of the common widespread ones have failed to appear. It has been stated generally to have been a very poor season for Mushrooms.

Miss Rob writes from the North Riding—" The year has been rather poor so far as bloom is concerned but owing to the wet weather vegetative growth is luxuriant. Some plants have been late flowering and the flowering period shorter than last year. There is a very good crop of fruit on the Ash, Hawthorn is normal to poor, Oak about average, Maple good, Elm below average, Lime average, Horse Chestnut poor. Cultivated fruit crops, including Plums and Pears, are below average, and Strawberries were very poor. The roadside verges in this district have been left unmown except for a narrow strip close to the road and the Cow Parsley has been a wonderful sight."

Mr. Murgatroyd from Halifax agrees in general with the above and thinks the year is the worst he can remember. He thought the Blue Bell display, besides being late, was rather poor. Meadow flowers, which had been held back until the July rain, made a fine show when the grass came. He thinks the number of plants attacked by mildew was very noticeable this year.

Plant Records (G. A. Shaw): I should like to thank all who have sent in lists, and while naturally not all are included in the report, those left out will be added to the records and so preserved for future reference. I must also express my thanks to Dr. Sledge for his assistance and advice during the preparation of this report.

† New to Yorkshire. * New to Vice-County.

Lycopodium clavatum L. (63). Two small plants near Gorple top reservoir; F. Murgatroyd. (Occurs in very small quantity some distance further down the Hebden valley.)

Osmunda regalis L. (63). Canal bank near Sowerby Bridge; Halifax Scientific Society, per F. Murgatroyd.

Dryopteris spinulosa (Mull.) Watt (63). Royd's Hall Wood near Wyke; F. Murgatroyd.

Ranunculus circinatus Sibth. (63). Two localities near Thorne (brickyard pond and near Tunnel Pits); W. Bunting.

**R. baudotii* Godr. (63). Brickyard pond, Thorne; W. Bunting.

Viola odorata × *V. hirta* (× *V. permixta* Jord.) (64). Austwick Moss (det. Valentine); G. A. Shaw. (63). Shireoaks; F. W. Adams.

Agrostemma githago L. (61). Cornfields near North Cave; E. Crackles.

Spergularia salina J. & C. Presl. (61). Near Flamborough Head; F. W. Adams.

Trifolium striatum L. (61). Sandy fields near North Cave; E. Crackles.

Circaea intermedia Ehrh. (63). Common along the streamsides in Ecclesall Wood, Sheffield; F. W. Adams.

Epilobium montanum L. × *E. obscurum* Schreb. (63). Goit stock, nr. Bingley; F. Murgatroyd.

E. roseum Schreb. × *E. obscurum* Schreb. (63). With the last; F. Murgatroyd.

Callitriche obtusangula Hegelm. (63). Ditches and dykes about Thorne; W. Bunting.

Apium graveolens L. (63). Near railway bridge over Dutch River, just west of Goole; W. Bunting.

Aster tripolium L. (63). Marshy ground between old colliery tips and Went Beck, Ackworth; N. V. Mendham. Beighton; F. W. Adams. Only previously known from the tidal portions of the Ouse.

Senecio fluviatilis Wallr. (*S. sarracenicus* L. p.p.) (64). Hedgerow near Buckles Inn, York-Tadcaster Road; Miss R. Kilby.

S. squalidus L. (64). Near Bolton-by-Bowland; J. N. Frankland.

Hieracium vagum Jord. (det. P. D. Sell and Dr. C. West) (61). Several bombed sites in Hull; E. Crackles.

× *Vaccinium intermedium* Ruthe (62). On the Levisham side of the Hole of Horcum, in local absence of *V. vitis-idaea*; F. W. Adams.

Pyrola rotundifolia L. (64). Riverside above Halton Gill; Miss Lapper per Miss Rob.

†*Empetrum hermaphroditum* (Lange) Hagerup (64). Skipton Moor at *c.* 900 ft. O.D.; J. N. Frankland. (Material gathered at Harkerside, near Reeth, on the 1953 Y.N.U. excursion appears to be a hermaphrodite state of *E. nigrum* L.).

Anagallis tenella (L.) Murr. (61). Plentiful west of Snake Hall Plantation, Hotham Carrs; E. Crackles.

Scrophularia umbrosa Dum. (64). Roadside ditch, Denton Hall, near Ilkley; A. Malins Smith.

Veronica catenata Pennell (63). Pond north of Jubilee Bridge, near Thorne; W. Bunting. Shireoaks; F. W. Adams.

Rhinanthus major Ehrh. (63). Near Lindholme, in both Yorks. and Lincs.; W. Bunting. It is interesting to note that practically the only genuine record for this species in Lee's *Flora* is for ' Thorne Waste, borders of, 1870.'

**Orobanche reticulata* Wallr. (61). North Grimston, on *Cirsium eriophorum* (chiefly) and *C. vulgare*; W. A. Sledge.

O. alba Steph. (64). On Thyme at Malham; J. N. Frankland.

**Mentha smithiana* R. Graham var. *angustifolia* R. Graham forma. (63). Rivelin Valley; F. W. Adams.

Hydrocharis morsus-ranae L. (63). Ings Pond, Snaith; W. Bunting. Recorded from Snaith long ago by Dr. Parsons.

Listera cordata (L.) R. Br. (64). A large colony, Gill Beck, Blubberhouses Moor; G. A. Shaw.

Orchis praetermissa Druce (det. Summerhayes) (63). Thorne Moors and Sykehouse; W. Bunting.

O. praetermissa Druce × *O. fuchsii* Druce (det. Summerhayes) (63). Sykehouse; W. Bunting.

O. purpurella T. and T. A. Steph. (62). Thornton Dale; Bradford Nats., per A. M. Smith.

Juncus compressus Jacq. (64). South bank ferry crossing near York; H. Walsh.

Eleocharis acicularis (L.) Roem. and Schult. (63). Woolley Dam between Wakefield and Barnsley; Miss J. Waring. Harthill reservoirs near Kiveton; F. W. Adams.

Scirpus tabernaemontani C. C. Gmel. (63). Near railway bridge over Dutch River just west of Goole; W. Bunting.

Carex serotina Merat (det. Nelmes) (61). Marshy ground, Kelsey Hill gravel pits; E. Crackles.

C. appropinquata Schumacher (*C. paradoxa* Willd.) (61). Leven Canal, confirming an old (1904) record of J. F. Robinson; E. Crackles.

C. ericetorum Poll. (63). Stapleton Park; F. W. Adams and C. D. Pigott.

Sieglingia decumbens (L.) Bernh. (61). West of Snake Hall Plantation, Hotham Carrs; E. Crackles. Bempton; F. W. Adams. This species not mentioned in J. F. Robinson's *Flora*.

Glyceria plicata Fr. × *G. fluitans* (L.) R. Br. (det. C. E. Hubbard) (61). Marshy ground near Hornsea Mere; E. Crackles.

**Calamagrostis neglecta* (Ehrh.) Gaertn. et al. (63). With *C. canescens* near the Canals above Moorends, Thorne; F. W. Adams.

Chara aculeolata Kuetz (63). Balne Pond; W. Bunting.

Aliens, Casuals, Etc.

†**Delphinium orientale* J. Gay (63). Casual. Rivelin Valley, Sheffield; F. W. Adams.

Papaver argemone L. (61). Near North Cave; E. Crackles.

Camelina sativa (L.) Crantz (63). Bingley sewage tip; E. Jackman per A.M.S.

Sisymbrium orientale L. (61). Leven; E. Crackles.

(*Amaranthus retroflexus* L., included in the 1952 report from Sutton, near Hull, has been determined by J. P. M. Brennan as the var. *delelei* (Richter and Loret) Thell.)

Chenopodium murale L. (61). Bombed site, Hull; E. Crackles.

Althaea hirsuta L. (64). In a field of Lucerne, Beningbrough near York; per A. W. Ping.

Salsola pestifer A. Nels. (61). Two bombed sites, Hull; E. Crackles.

Trifolium angustifolium L. (63). City Road sidings, Bradford; C. M. Rob and D. McClintock.

Melilotus indica (L.) All. (63). Growing on cinders, Beeley Wood, Sheffield; F. W. Adams.

Coronilla varia L. (63). Ruins of old mill, canal bank, near Elland; F. Murgatroyd.
Trigonella foenum-graecum L. (63). Garden at Halifax; H. Foster.
Potentilla norvegica L. (65). Sinderby station; C. M. Rob.
Epilobium lamyi F. Schultz (det. G. M. Ash) (61). Bombed sites, Hull; E. Crackles.
E. adenocaulon Hausskn. (det. G. M. Ash) (61). Bombed sites, Hull; E. Crackles.
Pastinaca sativa L. (64). Coach Road, near Shipley Glen; Mrs. Bastow, per A.M.S.
Lysimachia ciliata L. (62). Grounds of Poole Sanatorium, Nunthorpe, near Middlesbrough; O. C. Hill, per C. M. Rob.
Pentaglottis sempervirens (L.) Tausch. (61). Arram and Coniston; E. Crackles. (64). Long-established in a hedgerow, Hollins Hill, near Guiseley; F. Peverett, per A.M.S.
Verbascum virgatum Stokes (65). Sinderby station; C. M. Rob.
Stachys lanata L. (63). West Moor, near Thorne; W. Bunting.
Erigeron canadensis L. (61.) King George Dock, Hull; E. Crackles.
Senecio squalidus L. × *S. vulgaris* L. (det. Lousley) (61). Bombed site, Hull; E. Crackles.
Madia sativa Mol. (63). City Road sidings, Bradford; C. M. Rob and D. McClintock.
Centaurea aspera L. (63). With the last.
Lolium temulentum L. (63). Bingley sewage tip; E. Jackson, per A.M.S. Edge of garden path, Sharrow, Sheffield; F. W. Adams.
Polypogon monspeliensis (L.) Desf. (63). City Road sidings, Bradford; C. M. Rob and D. McClintock.

Bryology (Mrs. J. Appleyard): The retirement of Mr. H. Walsh from active field work with the Union will be regretted by bryological members. Mr. Walsh has greatly extended our knowledge of the moss and hepatic flora of the Halifax district both by his work in the field and among old records.

Two excursions have been held during the year. There have been few new vice-county records but many records from new localities. Mr. Cheetham reports that *Orthodontium lineare* is scarce on Austwick Moss and in several other places where it is usually abundant. It is less common in the Bradford district also this year. Possibly a succession of dry springs is responsible. Lack of moisture in the early part of the year may be the cause of abnormal behaviour in some other mosses, e.g. stunted growth and late or sparse fruiting. As late as September, *Splachnum* spp. which are usually to be found in fruit in certain stations near Austwick were only to be found barren.

Hepatics

(New Records)

Cephaloziella rubella Warnst. (63). Bare ground at edge of field, Shelf; J.A. This is the correct name for *C. myriantha* (Lind.) Schiffn. (Muller 1947). Only other record for Yorkshire, H. H. Knight, 1926.
C. hampeana (Nees) Schiffn. (63). On wet clay in a Sphagnum bog, Baildon; J.A.

(Other Records)

Riccia glauca L. (64). Bare rocky soil near How Stean. Bry. exc. 1953.
R. crystallina L. (61). On dried mud on a path, disused gravel pit, Thorpe-le-Street, Pocklington; R.L.
Ricciocarpus natans (L.) Corda (61). On mud and in water by pond, Rysome Garth, Holmpton, near Withernsea; R.L.
Aneura sinnata (Dicks.) Dum. var. *major* Lindb. (64). Wet ground, Esholt; J.A. (63). Abundant in Anstone Stones Wood; F.W.A.
Metzgeria pubescens (Schrank) Raddi (63). Anston Stones Wood; F.W.A. (64). Rocks by How Stean Beck. Bry. ex. 1953.
Blasia pusilla L. (64). Steep clay bank near Silsden; J.A. Old quarry, How Stean. Bry. exc. 1953.
Aplozia caespiticia (Lindenb.) Dum. (63). Bare soil on bank by a stream near Queensbury Station and Ovenden Moor; J.A.
Lophozia bicrenata (Schmidt) Dum. (64). On peat, Moughton Fell; J.A.

Calypogeia meylanii Buch. Sandstone rocks by River Greta, Burton-in-Lonsdale; J.A.
Scapania irrigua (Nees) Dum. (63). Bingley. (64). Tarn Moss, Malham. (65). Garsdale; J.A.
S. curta (Mart.) Dum. (64). Ribblehead and Silsden; J.A.
S. umbrosa (Schrad.) Dum. (64). Silsden; J.A. How Stean, Bry. exc. 1953. There are few records for the above three species but they are probably widespread.

Mosses

Atrichum crispum (James) Sull. (63). Refound at Hollow Meadows, Rivelin Valley; F.W.A.
Encalypta streptocarpa Hedw. (65). In fruit, Fremington; C. M. Rob.
Pottia davalliana (Sm.) C. Jens. (63). Fallow field, St. Ive's, Bingley. (64). Footpath near Wothersome Lake, Bramham; J.A.
Phascum curvicollum Hedw. (64). Whitecliffe, near Ripon, Bry. exc. 1953.
Barbula tophacea (Brid.) Mitt. (63). Ogden Clough; J.A.
Eucladium verticillatum (iWth.) B. & S. (63). Ogden Clough; J.A.
Leptodontium flexifolium Hampe (63). By stream running into upper Rivelin Valley; F.W.A.
Discelium nudum (Dicks.) Dum. (64). Steep clay bank near Silsden; J.A.
Physcomitrella patens (Hedw.) B. & S. (63). On dried up margin of fishing pond near Royd's Hall, Low Moor; J.A.
Ephemerum serratum (Hedw.) Hampe (64). Bolton Abbey; J.A.
Mnium affine Bland (63). Among grass in wet ground, Halifax Golf Course, Ovenden Moor; J.A. No locality given for the type in V.C. 63 in Yorkshire records.
Pohlia rothii (Correns) Broth. (63). Hollow Meadows, Rivelin Valley; F.W.A.
Bryum inclinatum (Brid.) Bland (64). Rocky ground near How Stean Beck, Bry. exc. 1953.
Philonotis caespitosa Wils. ex. Milde (63). Wet ground, Halifax Golf Course, Ovenden Moor; J.A.
Campylium sommerfeltii (Myr.) Bryhn (62). Calcareous bank by roadside, Hawnby Bank; J.A.
Hygroamblystegium tenax (Hedw.) Jennings (62). On stones under bridge over River Rye, Ashberry, Y.N.U. exc. (63) var. *spinifolium* Schp., Roche Abbey; F.W.A.
Amblystegium juratzkanum Schp. (64). Damp grassy bank near sewage works, Esholt; J.A.
Rhyncostegiella teesdalei (Sm.) Limpr. (65). By River Lune, near Sedbergh; G.A.S.
Records contributed by F. W. Adams, J. Appleyard, R. Lewis, G. A. Shaw.

Bryological Excursion, August.—Very few members attended the meeting, which was held under exceedingly bad weather conditions. Rain was continuous and the light so poor that it was impossible to see small bryophytes in the dark enclosed ravine of How Stean. Above the ravine it was a little lighter and *Cololejeunea calcarea* was seen on shaded calcareous rocks in company with a barren *Seligeria*, probably *S. tristicha*. Really efficient collecting was impossible under such conditions and it was felt that the upper part of How Stean Beck would repay another visit. An old quarry below How Stean had some interesting species, including *Pellia fabbroniana, Reboulia hemisphaerica, Blasia pusilla, Sphenolobus exectiformis, Dichodontium pellucidum* c. fr., *Orthotrichum cupulatum* and *Dicranella varia*. There was *Orthotrichum anomalum* var. *saxatile* on the stone bridge and underneath were found *Cephaloziella starkei, Mnium marginatum* and *Eurhynchium crassinervium*. Bryophytes collected in and above How Stean included *Riccia glauca, Metzgeria pubescens, Pedinophyllum interruptum, Lophozia floerkii, Scapania umbrosa, Fissidens crassipes, Bryum inclinatum* and *Cinclidotus fontinaloides*.

Ecology (Miss D. Hilary): By the death of Mr. W. E. L. Wattam, the Ecological Committee has lost its oldest and one of its keenest members. We shall miss his kindly presence at our meetings and his many contributions to our work.

Juniper.—Mr. A. Malins Smith sends the following summary of observations on Juniper made by Mr. G. F. Horsley:

'Mr. G. F. Horsley has been observing Swaledale Juniper since October, 1952, and has sent in some interesting reports which he will, no doubt, collect together

and submit to *The Naturalist* later. I should like, however, to mention here some results he has obtained this summer by measurement of young Junipers growing in the Italian Dolomites at Stava at an elevation of 4,600 ft. He counted the annual rings and measured the diameter of the wood cylinder of twelve young plants from 13 to 31 years of age. He thus got the annual increase in diameter and it ranged from ·14 mm. to ·50 mm. It may be interesting to compare these figures with those I obtained from plants on Moughton. From 15 specimens under 30 years old my figures were from ·08 mm. to ·25 mm. The rate is thus rather higher in Italy. This may perhaps be accounted for by the more southern latitude which has probably greater amounts of sunshine.

' Other similarities between Italian and Moughton Juniper noted by Mr. Horsley were: dead shoot tips with brown leaves, occasional dead bushes, one-sided growth of the wood, and terminal insect galls. There is also some evidence of the presence of the parasite *Gymnosporangium.*'

I may here mention that in a visit to the Austrian Tyrol in June of this year I again encountered the Juniper problem. During three weeks in the Stubaital some scores of Juniper plants were examined, only *one* healthy Juniper being found. Many were dead or dying and those which at first sight seemed healthy, on closer examination were seen to have the familiar brown shoot-tips. In almost every case, the Junipers were growing in close proximity to Larch and Spruce, both of which were perfectly healthy. The problem thus seems to be not merely a British, but a European one.

Miss Crackles is still working on the flora of bombed areas in Hull. She has done some research into human activities likely to be responsible for the introduction of plants into the city, and is continuing to investigate the succession of plants on recently cleared sites.

Mr. C. Hemingway has begun work on the ecology of the ' Island ' Hook near Goole. He says: ' This is an area, opposite Howden Dyke, which was apparently at one time an island but through silting is now easily accessible. Extremely high tides do flood it and leave behind a further layer of sediment. A slight change has been effected this year through the activities of the Ouse River Board who are strengthening the banks.

' The dominant tree is willow and I feel there is scope here for a lot of work in sorting them out. Among these are odd ash, elder and poplar trees. The ground flora is essentially *Impatiens glandulifera.* It is so profuse that its seedlings form a green carpet. In one part, where these do not form a closed association, are a few plants of *Ranunculus ficaria, Cardamine pratensis* and *Caltha palustris,* the latter being remarkably scarce.'

Mr. Hemingway remarks that since coming to Goole he has been surprised by the absence of many common plants rather than the occurrence of anything unusual. He has not seen a single specimen of *Arum maculatum* or of the campions (Red, White, Bladder and Ragged Robin).

In conclusion I should like to mention our plans for next year, viz. a week's intensive ecological study in the Malham Tarn area. It is proposed that the visit should coincide with that of the Entomological Section, the probable date being the last week in July. The idea is to get together a team of workers, keen on doing some ecological work and that botanists and entomologists work together. Will anyone who would like to join such a team please get in touch with either the Chairman or the Secretary ?

Mycology (Miss J. Grainger): The year has been one of progress. In the middle of March the Spring Foray was held at Bramham Park and Leeds. The attendance of over thirty was a record. The Autumn Foray was also well attended, but the weather at Sandsend had been dry for some weeks and fungi were not plentiful. This was disappointing as Mulgrave is considered classic ground.

We have been fortunate in having Miss Blackwell return to the Huddersfield area to live, after many years of absence. This has resulted in two local afternoon forays, which were very rewarding to the people attending them. At the first, held in mid-September, two prominent members of the North Western Naturalists' joined us, and there were interesting finds in the woods around Woodsome Lees. The second foray, held on October 24th, was to investigate part of Honley Wood and the beech area of Reservoir Wood, Meltham. *Craterellus cornucopioides* (Linn.) Fr. was an interesting find on this excursion.

YORKSHIRE NATURALISTS' UNION

INCOME AND EXPENDITURE ACCOUNT for the Year ended 20th November, 1953

EXPENDITURE

	£ s. d.	£ s. d.
ERAL PRINTING:		
rculars	84 2 0	
embers' Cards	23 15 6	
nual Report	17 3 6	
		125 1 0
E NATURALIST":		
embers' and Exchange Copies	295 14 10	
tra Pages	121 14 0	
litorial Expenses	5 0 0	
		422 8 10
ORY EXPENSES:		
nk Charges	3 1 0	
nt of Rooms	0 11 0	
cursion Expenses ..	0 11 0	
ationery, etc.	11 13 5	
cretaries' and Treasurer's Petty Cash	20 1 0	
penses of Mammals, etc., Committee	1 3 5	
		37 0 10
		£584 10 8

INCOME

	£ s. d.	£ s. d.	£ s. d.
MEMBERS' SUBSCRIPTIONS:			
Allocated to *The Naturalist*		275 16 6	
,, General Expenses		100 12 0	
		376 8 6	
Less Arrears brought forward from 1952	40 0 0		
Deduct Payments in Advance—1952 ..	14 0 0		
		26 0 0	
		350 8 6	
Add Arrears at 20th Nov,, 1953, after making necessary reserve	50 0 0		
Deduct Payments in Advance.. ..	11 11 0		
		38 9 0	
			388 17 6
LEVIES FROM AFFILIATED SOCIETIES		13 16 9	
Add Amount due 22nd November, 1953		11 5 9	
		25 2 6	
Less Amounts due 20th October, 1952		0 19 6	
			24 3 0
SALE OF PUBLICATIONS			1 15 4
DISCOUNTS RECEIVED			13 11 2
DONATIONS TO FUNDS			3 15 0
INTEREST FROM INVESTMENTS			21 7 6
DEFICIT of Income to meet Expenditure for the year, carried to accumulated Fund			131 1 2
			£584 10 8

BALANCE SHEET as at 20th November, 1953

LIABILITIES AND FUNDS

	£ s. d.	£ s. d.
STED FUNDS:		
oth Fund	100 0 0	
eeseman Fund ..	100 0 0	
nithological Fund ..	100 0 0	
		300 0 0
R FUNDS (Legacy of the late R. C. Fowler-Jones):		
ocated to Mycological purposes	250 0 0	
ocated to General purposes	250 0 0	
		500 0 0
MULATED INTEREST ON ORNITHOLOGICAL FUND:		
ount as at 20th October, 1952	3 3 9	
d Amount during year ..	1 12 3	
	4 16 0	
s Amount disbursed ..	3 3 9	
		1 12 3
MEMBERS' ACCOUNT as at 20th tober, 1952		477 0 0
ICATIONS FUND:		
at 20th October, 1952 ..	196 16 0	
cial Sales	3 7 5	
	200 3 5	
s Cost of Special Mycological Publications .. 89 11 0		
duct es before h October, 1952 .. 59 2 10		
es during r .. 23 18 11		
	83 1 9	
	6 9 3	
	193 14 2	
nsferred from Accumulated 'und..	193 14 2	
		£1,278 12 3

ASSETS

	£ s. d.	£ s. d.
INVESTMENTS OF FUNDS (NOMINAL VALUES):		
£110 3½% Conversion Stock ..	100 0 0	
£100 3½% War Stock	100 0 0	
£100 3% British Transport Guaranteed Stock, 1978-1988	100 0 0	
		300 0 0
GENERAL INVESTMENTS (NOMINAL VALUES):		
£200 4% Consols (Bank of England)	200 0 0	
£159 10*s.* 11*d.* 4% Consols (Post Office)	159 10 11	
		359 10 11
SUBSCRIPTIONS AND LEVIES OUTSTANDING (*Less* Reserve)	61 5 9	
Less Subscriptions paid in advance	11 11 0	
		49 14 9
WESTMINSTER BANK LTD.:		
Deposit Account	500 0 0	
Current Account	37 9 10	
		537 9 10
ACCUMULATED FUND:		
Amount Forward (Dr.)—20th October, 1952	94 9 9	
Deficit for year from Income and Expenditure Account	131 1 2	
	225 10 11	
Less Transfer to Publications Fund	193 14 2	
		31 16 9

Audited and found correct,

W. A. WILSON,
W. BENNETT } *Hon. Auditors.*

J. D. HARTLEY, *Hon. Treasurer.*

£1,278 12 3

BOOK REVIEWS

The Herring Gull's World: A Study of the Social Behaviour of Birds, by **Niko Tinbergen.** Pp. xvi+255. Collins, 1953, 18/-.

Dr. Tinbergen is a leader in the analytic investigation of animal behaviour and he here sets forth the results of many years' study by himself and his colleagues of his favourite bird. His book should be read by all those interested in animal behaviour and not only by ornithologists. The bird-watcher will find it stimulating to be conducted into country which may be somewhat unfamiliar to him, for Dr. Tinbergen is primarily concerned with the mechanisms responsible for gull behaviour. The emphasis is ethological rather than ecological.

As long ago as 1928 F. B. Kirkman published a paper on ' What a bird will sit upon,' although it was not until nine years later that his book *Bird Behaviour* appeared, giving an account *inter alia* of his experiments to discover what Black-headed gulls would accept as egg-substitutes. The same year F. Goethe in Germany published a monograph on the herring gull in which he described experiments designed to show that the red spot on the adult's lower mandible served to guide the chick's begging movements. Dr. Tinbergen has carried such lines of research further. He has found evidence, for example, that herring gulls, like oystercatchers, prefer eggs considerably larger than their own, and he has been able to devise an artificial gull's bill—a red rod with three white rings—which stimulates the chick more effectively than a normal bill. These examples will suffice to indicate with what ingenuity his investigations have been conducted. Many other aspects of gull behaviour are discussed and there is an illuminating analysis of the components involved in display postures. On noting that research projects of this kind are being organised on an almost world-wide scale the reader will realise how far we have travelled from the days when Kirkman, a self-taught amateur, did his pioneer work.

Since Fraser Darling's *Bird Flocks and the Breeding Cycle* is the only book on gull behaviour published since Kirkman's and is specifically ' a study of the social behaviour of birds '—the sub-title of Dr. Tinbergen's book—it is odd not to find any mention of it. There is no reference to Fritsch's work nor to the important paper by Paludan in which he shows that the herring gull is not strictly a determinate layer. The theory that the white colouration of sea-birds serves as social signalling is dismissed as incorrect although every sea-coast naturalist has observed numbers of gulls or gannets congregating to where they had seen some of their fellows exploiting a supply of food. Variations in the vernacular names of birds already give the ornithologist considerable trouble so it is regrettable to find such innovations as 'Grey-Heron ' and ' English Robin '.

The book contains an excellent series of photographs by the author which really illustrate the letterpress, though it is a little difficult to understand why space was found for a picture of a basketful of gull's eggs, and some readers may be misled by the photograph captioned ' A Typical Herring Gull's Nest ', for the nest is situated beside, and apparently partly underneath, a bush.

E.A.A.

A Thousand Geese, by **Peter Scott** and **James Fisher.** Pp. 240, with 1 coloured plate, 25 photographs, 11 maps, and many line drawings. Collins, 21/-.

The results of the Severn Wildfowl Trust's expedition of 1951 to Central Iceland, which included the discovery of the largest-known colony of pink-footed geese, and the ringing of 1,151 of them, are, through many sources, now well-known. It is good, however, to have this book by Peter Scott and James Fisher, in which are collected within one volume all the details of this most successful expedition. The official reports, which are the bounded duty of all expeditions, too often, perforce, summarise bald facts, and, by custom, omit so much that is lively and entertaining. Yet the pursuit of birds is an adventure as well as a science. By such books as this, with its wealth of detail not only about natural history but also about everything from beards to appetites, the literature of ornithology is enhanced. A glance at the index will give a clear insight into the authors' approach, and quickly reveals that their scientific object in no way destroyed their sense of humour and fun. Yet, if the book may fairly be described as informal, it is everywhere informative, and, as with everything with which Mr. Fisher is associated, there is behind the informality a healthy and robust scholarship, which is revealed in the valuable chapters on the world distribution of the pink-footed goose and in the appendices.

The expedition was part of a detailed study of the pink-footed goose now being carried out by the Trust, and as a result of it and Mr. Scott's recent expedition

(1953), probably one in every five pink-footed geese in the world now wears a ring. It seems clear that in the near future we shall know more about the population, movements, etc. of this species than about any other living creature.

Nevertheless, operations such as are described in this book, to which must be added Mr. Scott's even more successful expedition of 1953, involve considerable disturbance of the remote nesting-grounds of a retiring bird, and above all runs the risk of breaking up the family tie which is so highly developed in geese. This apprehension has recently been voiced in *The Times* (correspondence: October 24th, 1953 and after). It is reassuring to know that Mr. Scott fully appreciates the danger, and does not propose to return to the colony for at least five years.

Modern reviewers seem to be charged with a duty to find faults, often petty ones, far too often at the expense of the merits of a book. With this attitude I have little patience, and in any case I cannot find any such errors; but I have one complaint about this book. When one of the authors is so great an artist, it is a thousand pities that the publishers have only been able to give us one colour plate from Mr. Scott's able brush. Doubtless, economy demands it: it is nevertheless regrettable. I would dearly like to see the picture Mr. Scott would make of a drake Harlequin duck in an Icelandic background of marsh marigolds, waterfalls and mountains.

G. K. Y.

Feathered Wings, by **Anthony Jack.** Pp. 131, with 16 photographs and 45 line illustrations. Methuen & Co. Ltd., 15/-.

The mechanics of bird-flight are a branch of ornithology little understood by the average bird-watcher. Flight most of us accept as an intrinsic and beautiful feature of the objects of our attention. Yet how little do we understand *how* a bird flies ? Nor indeed have we much to help us in the literature, for what there is is mostly too technical to aid our better understanding.

Mr. Jack has in this book filled a very real need, for *Feathered Wings* is a serious and successful attempt to explain to the layman the aerodynamics of bird-flight. Such a subject must clearly contain much that is technical, and if parts are, as the author himself warns, ' heavy going ' for the uninitiated, the fact remains that he has very successfully reduced the technicalities to a minimum, and has set down the underlying principles of his difficult subject in terms which the amateur can comprehend. His theories and explanations are admirably supported by many excellent diagrams.

I must confess myself unqualified to criticise Mr. Jack's aerodynamic theories, and it might well be thought that a book of this nature should be reviewed by one better versed in the subject matter. The book, however, is avowedly written for the layman. There is, therefore, this advantage in an amateur critic—that if the author can make his technical argument clear to him, then indeed he may fairly claim to have been successful in his object. Perhaps the fairest comment on the book is to say that I finished it with a clearer understanding of how a bird flies than I have ever had before.

G. K. Y.

Bird Ringing: The Art of Bird Ringing by Individual Marking, by **R. M. Lockley** and **Rosemary Russell.** Pp. 119, with 8 pages of plates and numerous sketches in the text. Crosby Lockwood & Son, Ltd., 9/6 net.

The history, value and technique of bird-ringing are reviewed, 56 pages are devoted to methods of trapping, and ' Rings, Records and Equipment ' described. Appendices deal with ' A Model Life-study by the Ringing Method,' ' British Bird Observatories ', and a ' Selected Bibliography ', followed by an index. The book is a *vade-mecum* for ringers of all types. Italics emphasise the important part of the sentence—' From the humane point of view there is nothing to be said against ringing, *provided it is done properly*, by the methods described in this book.' The proper methods are well described and should be amplified by experience in company with an expert. Promiscuous birds-nesting with the object of ringing nestlings is wisely discouraged; as the late Lord Grey pointed out, tracks and traces are difficult to avoid and may betray nests to enemies. Do the legs of adult birds of all species *never* thicken ? The use of pliers for closing the ring is recommended—it might have been added that one should know the feel of the pliers used. Experienced ringers carry their own. Traps of many kinds are described and illustrated.

It is a pity in such a book that appendix 2 should begin with an error in the list following the statement ' Coastal Bird Observatories were established in the British and Channel Isles in the following order ', with Spurn placed fifth, when factually it was third. Ringing began at Spurn in November 1945, and Spurn was one of three observatories included in Miss Leach's report for 1946 (see *British Birds*, 1947, p. 270). A meeting of the Bird Observatory Committee was actually held at Spurn on October 5th, 1946, attended by representatives of the three observatories then existing (Skokholm, May, and Spurn) and by Mr. W. B. Alexander and Miss E. P. Leach. Neither Fair Isle nor Lundy began until 1947.

R. C.

An Irish Sanctuary. Birds of the North Bull, by **P. G. Kennedy, S.J.** Pp. 168, with 23 plates, 3 in colour, and many sketches in the text by Roland Green. The Sign of the Three Candles, Ltd., Dublin, 12/6.

The North Bull Island, only four miles from the centre of Dublin, has become the first Irish bird sanctuary under an Act passed by the Dail in 1930. Father Kennedy amplifies his well-known articles and broadcasts readably and attractively. The Witherby nomenclature and order are used concerning the 156 species and racial forms recorded, a few perhaps not completely convincingly. Richard's Pipit and the Fulmar are square-bracketted. Pintails are much more frequent than 25 years ago. Flocks of waders are often large, and include not very unusually such species as Little Stint and Spotted Redshank. December is the month in which the largest number of species have been recorded (101), by June the number has dropped to 53, rising in August to 66, in September to 76, with 82 for October, and 95 for November. Five grebes and three divers are included. Seventeen species have bred, including the Little Tern which has however now ceased to do so.

In a final chapter, Father Kennedy discusses a possible threat to the sanctuary's existence by proposals to make an amusement centre of the island, using words that seem strangely applicable to the Spurn Peninsula, with which the North Bull has much in common, ' It would be a crying shame if this ideal sanctuary were destroyed.' If such happened our opinion of the standard of Dublin civilisation would be lowered.

R. C.

Sold for a Farthing, by **Clare Kipps,** with a Foreword by Julian Huxley. Pp. 72, with 13 photographs by Kenneth Gamm. F. Muller, London, 1953, 5/-.

This charming little book is the biography of a cock House-sparrow. Picked up on a London door-step when but a few hours old, naked, blind and deformed, it was tended and reared by the author, with whom it resided as a constant companion until its death some twelve years later. From the moment when it first opened its eyes and beheld the author, she was the centre of its world and no outside events, not even the presence of other birds, influenced its conduct. Throughout its life its established roosting place by day was inside the jumper that she was wearing and by night a hollow under the eider-down quilt on her bed. The relationship was in many respects similar to that established between Konrad Lorenz and his goslings, but in this case it continued during the whole life-time of the bird. The account of its actions and re-actions and of the remarkable adaptability of its behaviour is very vividly related. Unable to fly, on account of a deformed wing, it never knew the freedom of the open air; but it went everywhere with its adopted parent, sharing, throughout the war years, the visits which, as an Air-raid Warden, she spent in London Civil Defence Posts and Rest Centres, where it narrowly escaped being ' blitzed '. An interesting and unexpected development was its response to music. The sound of the piano arrested its attention and encouraged it to chirp and sing, practising new notes and trills until it built up a tuneful and varied song-cycle, bearing no relation to the harsh calls and twitterings of its own kind and quite unlike that of any other species. At its best it consisted of two distinct phrases, the second being a trill of eight separate notes.

Unfortunately no photographic records were taken of this unique Sparrow until the final years of its life, so the illustrations portray an old and decrepit bird which had lost much of its youthful activity, though it maintained its individuality until its death of old age.

Students of bird behaviour will find much of interest in this remarkable book.

G. W. T.

Transactions of the Natural History Society of Northumberland, Durham and Newcastle-on-Tyne. Vol. x, No. 2, *Ornithological Report on the Farne Islands for* 1952, by **Miss Grace Watt.** Vol. x, No. 3, *Ornithological Report for Northumberland and Durham for* 1952 by **G. W. Temperley.**

Both these reports are highly interesting. Both follow the version of the Wetmore order of classification given in the new *Check-List of Birds of Great Britain and Ireland* (1952). Each author acknowledges the considerable help given by Dr. Ennion, of the Monk's House Bird Observatory.

Miss Watt reports the addition of eight species to the systematic list of birds recorded for the Farne Islands, of which the least expected is that generally sedentary bird the Nuthatch. Many local breeding birds have been ringed, and a start has been made with a Heligoland-type trap on the Inner Farne. The two and a half pages of ' Recoveries of Ringed Birds ' fails to indicate precisely where the birds were ringed although the places of recovery are stated. Dr. Ennion has begun a special study of nesting Rock-pipits using different coloured rings to indicate different island sources of the species; and observers are asked to notify him of any colour-ringed Rock-pipit anywhere. ' Sandwich Terns did extremely well ', and at least 31 pairs of Roseate Terns were present.

Mr. Temperley's report, for a number of years past, has appeared in *The Naturalist*, in which the 51 pages of this 1952 edition could hardly have appeared in its present form. No longer anchored to an established journal he has been free to make his *format* as he would like it, but to be so anchored is not without advantages. Some of Mr. Temperley's more important items are duplicated in the Farne Islands Report, which is better than to have to search for special records in two places, others are omitted by Miss Watt. The Montagu's Harrier bred in Co. Durham and attempted to do so in Northumberland. The Scandinavian Chiffchaff is apparently accorded specific rank. A very interesting record is that of two Golden Mountain-thrushes (White's Thrush) on April 26th, at Belsay. Examined pellets of a pair of breeding Long-eared Owls showed ' undoubted evidence of Kestrel as prey.' These are merely examples of the many interesting items included in an excellent report, written in Mr. Temperley's usual lucid and attractive style. No price is cited for the possible purchase of copies.

R. C.

Handbooks for the Identification of British Insects. Published by the Royal Entomological Society of London, 25th August, 1953.

Vol. IV, Part 3, Coleoptera, Hydradephaga, by **F. Balfour-Browne.** Pp. 33, 44 figs. 6/-.

Vol. V, Part 7, Coleoptera, Coccinellidae and Sphindidae, by **R. D. Pope.** Pp. 12, 23 figs. 2/6.

Vol. V, Part 15, Coleoptera, Scolytidae and Platypodidae, by **E. A. J. Duffy.** Pp. 20, 40 figs. 3/6.

Vol. X, Part 1, Diptera, Syrphidae, by **R. L. Coe.** Pp. 98, 46 figs. 17/6.

The four latest parts are a very welcome addition to the series of Handbooks published by the Royal Entomological Society of London, whose decision to provide authoritative and yet succinct synopses of the British insect fauna is a matter both for congratulation and gratitude.

All four parts are excellently done and will be of the greatest service to British entomologists. The utility of Mr. Duffy's keys of the Bark beetles has been much increased by the inclusion of the commonly imported species. Professor Balfour-Browne's keys, corrected and improved, are based on those included in his two well-known volumes on Water beetles published by the Ray Society. The key to the numerous species of *Hydroporus* is entirely new. The vast numbers of aberrations and varieties among the Ladybirds are inevitably excluded from Mr. Pope's synopsis. It is interesting to note that he supports Weise, Mader and other continental workers in dividing *Scymnus* into three separate genera (*Pullus, Scymnus* and *Nephus*). The Hoverflies (Syrphidae) are one of the most popular families of the Diptera and Mr. Coe's excellent volume will be eagerly used by Dipterists.

W. D. H.

A Herd of Mule Deer, by **Jean M. Linsdale and P. Quentin Tomich.** Pp. xiv + 567, with numerous illustrations and text figures. Published by University of California Press, and obtainable from Cambridge University Press, 64/-.

This is a definitive work which exigencies of space compel us to notice rather than to review. Although expressly an ecological study within a defined habitat, the Hastings Reservation, the opening chapters deal exhaustively with structural characteristics, with sensory effectors and receptors and with behaviour. These occupy two-fifths of the work and a further seventy pages is devoted to relations with other animals, not only parasitic, predatory, commensal and coprophagous but also those which give warning, provide some disinfestation or are merely tolerated.

Remaining chapters treat of the relationship of the animal to the particular habitat under consideration with reference to such aspects as terrain, fencing, trails, water and climate; to the periodicity of various activities, to food, which is fully listed and to the various facets of the reproductive cycle.

Tables, graphs and diagrams are freely employed and the book is fully illustrated by photographs and drawings in the text. The authors, who themselves have spent a very great amount of time in the field, acknowledge the contributions of a whole team of observers and referees and the book is produced in such style and quality as our own limitations of purse and paper would nowadays lead us to describe as transatlantic lavishness. It is a delight to see it.

E. H.

The Ancient White Cattle of Britain and their Descendants, by **G. Kenneth Whitehead.** Pp. 174, with 48 photographic plates. Faber & Faber, Ltd., 1953, 63/-.

The origin of the White Cattle of Britain offers a field for conjecture as intriguing as any detective story and Mr. Whitehead has succeeded in presenting the available evidence in a manner both authoritative and stimulating. Although he reaches the personal conclusion that these cattle are most likely to be descended from the sacrificial white cattle introduced by the Romans, he gives full details in support of other theories widely held. Thus he devotes one chapter to the Aurochs (*Bos primigenius*) and the possible part played by them in the anceestry of domestic cattle generally.

The significance of the white colour is fully discussed and vivid and detailed accounts follow of the five extant herds of horned White Cattle in this country. Of these the Chillingham herd, famous in their isolation in Northumberland for 700 years is the best known, and has always captured the imagination of all interested in wild life and in the development of agriculture. Each herd is given full consideration with complete records of its history and appearance to-day. In the final section of the book a description is given of all the other known herds of White Cattle, both extinct and also those now members of the modern breed of British White Cattle—characterised by polled heads, white colour and black points. Nor is this a mere catalogue—the author succeeds in imparting to each herd an expression of its own individuality.

Naturalist and agriculturist alike will read this fascinating book with enjoyment. It is well illustrated by excellent plates and has a full bibliography

T. G. B.

Birds of Ceylon, II (Birds of Our Swamps and Tanks), by **W. W. A. Phillips.** Pp. 49 with 20 coloured plates by Cicely Lushington and 5 photographs. Associated Papers of Ceylon, Ltd., Colombo, 1952.

This pleasant little book is the second of its series, which plans to introduce, in five small volumes, about a hundred of the best-known birds of Ceylon. The previous section dealt with garden birds and the author has now turned his attention to water-birds and birds living in the neighbourhood of water. The text is both interesting and accurate, and the plates should ensure ready identification, although we notice that the Purple Heron is drawn larger than the Grey and that the Cattle Egret appears somewhat brilliant in colour. There is a map showing climatic zones and natural reserves, and each volume contains a short essay on an ornithological subject—in this case on bird photography. These books should not be under-rated on account of their small size; they perform a most useful function in teaching the public to adopt a sympathetic attitude towards bird-life.

M.F.M.M.

New Concepts in Flowering Plant Taxonomy, by **J. Heslop-Harrison.** Pp. viii × 135 with 12 text figures. William Heinemann, Ltd., 1953. 6/-.

This book gives an account of what is generally known as experimental taxonomy; that is to say, it deals with the application of the ideas and techniques of modern cytogenetics to taxonomic problems.

Some idea of its scope may be given by a brief summary of its contents. The first chapter gives as an introduction an excellent account of the development of taxonomy since Linnaeus. The second distinguishes between genotype and phenotype and deals with the subject of phenotypic plasticity; and the third describes the kinds of breeding system found in Flowering Plants and their relation to population structure; it also contains a useful introduction to biometrical method. Next comes a description of the way in which the ecological differentiation of populations has been investigated by Turesson and his followers. This leads to a discussion of geographical variation and genetical isolation and then to a short chapter on cytology and taxonomy. After discussing and defining the various special classifications that have been proposed (*e.g.*, ecotype—ecospecies—coenospecies), the author sums up the differences in the aims and methods of orthodox and experimental taxonomy and outlines a new system of terminology now under consideration.

A useful short list of suggestions for further reading is given, from which, surprisingly, the important book of Stebbins on Variation and Evolution is omitted. It would be ungracious to complain that the author has been rather sparing with examples of specific cases to illustrate his general points; one can only admire the skill with which he has covered such a large amount of ground while maintaining both the interest and clarity of his text.

The amateur naturalist may find some parts of the book a little difficult to follow but a good glossary is provided to help him with the technical terms. There is no doubt that the book, which is most reasonably priced, will be welcomed in schools and universities, and that it will stimulate interest in a fascinating and rapidly developing field of work. It is to be most heartily welcomed. D.H.V.

Flora of Bedfordshire, by **J. G. Dony.** Pp. 532, with 25 photographic illustrations, 22 distribution maps and text figures, and a map of the county. Published by, and obtainable from the Luton Museum, 42/-.

The compilation of a county flora is a formidable undertaking. The standard required of such a work demands many years of critical field and herbarium studies, much bibliographical research, a voluminous correspondence with specialists and with indigenous, adventure and casual botanists, and the exercise of careful judgement in sifting and assembling the accumulation of data and planning the format of the work. Failure to do proper justice to any one of these requirements is to invite criticism.

It may be said at once that Dr. Dony's work successfully passes the test. One of its many merits is its comprehensiveness; mosses, liverworts, stoneworts and fungi all being included. Of particular interest and value also is the section which follows the more conventional introductory accounts of the history of botanical investigation of the county and of the climatic, geological and edaphic factors. This section gives habitat studies of eighty-six localities representative of the different ecological communities developed in chalk, clay, greensand, gault, clay-with-flints, and alluvial soils. These detailed habitat studies not only give a far better picture than is usually available in county Floras of the floristic composition and frequency of species in typical environments but the exact localisation of each station by means of grid references will make it possible to determine with considerable accuracy future changes which the flora may undergo.

The ecological diversity and well-wooded nature of the county give considerable variety to the flora despite the absence of high ground. The choicest items include such rarities as *Bunium bulbocastanum, Seseli libanotis, Hypochaeris maculata, Primula elatior* and *Ornithogalum pyrenaicum,* while chalk scrub and grassland yield many other interesting and uncommon species. The flora has however suffered severely by drainage of bogs and marshes and the list of extinctions largely caused by such changes is a regrettably long one amounting to about 50 vascular plants and 25 bryophytes. A few interesting gains offset to some extent the many losses.

Dr. Dony's well-known interest in alien and adventive species has led to a thorough treatment of these plants but he has wisely refrained from overloading the

Flora by the inclusion of all aliens within the main body of the work. The more ephemeral waifs and strays which have often disappeared from their stations before they can be recorded even in an annual report are rightly segregated in an appendix from those which have gained a more or less permanent footing and which are therefore properly included amongst the established plants of the county. He has also refrained from swelling the entries by including all published names of dandelions, shepherd's purses and pansies which could doubtless have been accumulated from B.E.C. reports but which are of dubious scientific value. In the matter of nomenclature, Dr. Dony has refused to follow slavishly the names adopted in the new British Flora. Considerable departures from that work are seen for example in his treatment of the Cyperaceae and Gramineae and many botanists will applaud the wholesome independence he has shown in this respect.

The pattern of any county Flora is largely governed by accepted conventions such that the manner of presentation imposes severe restrictions on originality. Yet the most successful Floras invariably reflect the author's personality and particular gifts, and give to his work an individuality without which the mere synthesis of his own field, herbarium and library studies with those of his co-workers and advisers, however meticulous it may be, is apt to yield only an arid catalogue of facts. The merit of Dr. Dony's Flora lies in the fulfilment of this criterion. As Sir Edward Salisbury says in his Foreword, it will undoubtedly take ' a worthy place amongst its predecessors and contemporaries '.

W. A. S.

Geology of the Country between Bradford and Skipton, by **J. V. Stephens, G. H. Mitchell** and **W. Edwards.** *Mem. Geol. Survey.* Pp. 180. H.M. Stationery Office, 1953. 25/-.

This memoir completes the account of those areas of the Yorkshire Coalfield and surrounding districts resurveyed in the years before the war. In view of the great thickness and abundant exposure of the Millstone Grit Series in this area, it is natural that the largest part of the volume is devoted to the stratigraphy and palaeontology of these rocks and the volume will undoubtedly be the standard work of reference for many years. Individual exposures are described in considerable detail and the grid-references enable easy localisation in the field. The Coal Measures are similarly treated although this Series has no longer any importance as a source of coal. Especially valuable is the chapter, by K. C. Dunham, on the Petrography of the Millstone Grit and Coal Measures with the important conclusion that little alteration has taken place in the sandstones since their deposition.

The area includes the well-known glacier-lakes area of Jowett and Muff and the present authors have elaborated and in some respects corrected the older work while their diagrams enable the sequence of events to be much more easily appreciated. The twenty pages devoted to glacial and recent deposits are a mine of information and should be especially valuable to naturalists interested in soil variation. The rôle of the Guiseley Gap during the Ice Age is mentioned but no reference is made to the old problems of the origin of this feature.

Perhaps the only disappointing element in the volume is the relatively short treatment of the structure of the area but the authors suggest that the complexity of the fault pattern prevents any clear picture of folding. In all, the memoir can be thoroughly commended to local workers and it goes far to counterbalance the disappointment caused by the memoir on the sheet to the east. The price will, unfortunately, act as a deterrent to many.

H.C.V.

The Liassic Ironstones, by **T. H. Whitehead, W. Anderson, V. Wilson** and **D. A. Wray.** *Mem. Geol. Survey.* Pp. 211. H.M. Stationery Office, 1952. 25/-.

This volume is a further of the series on ironstones arising from the war-time investigations of the Geological Survey. The areas dealt with include Cleveland, North Lincolnshire, Leicestershire and the Banbury area. Little new information is given for Cleveland and it is concluded that this area has little future as a producer. The description of the North Lincolnshire field is the result of a survey on the six-inch scale by Dr. V. Wilson and this part of the volume is perhaps the most interesting to northern readers. Determination of the eastward extension of the ironstone has enabled a proved reserve of 546 million tons to be estimated with a further probable reserve of 350 million tons. These figures make this field the most important of the Liassic Ironstones.

H.C.V.

Freshwater Microscopy, by **W. J. Garnett.** Pp. xii+300, with about 200 photographs and 47 figures in the text. Constable & Co., 1953, 30/-.

The naturalist desirous of studying the fauna and flora of our inland waters has, until recently been sadly hampered by the lack of suitable books. This is particularly the case with microscopic life as existing works are either highly technical or very expensive or fail to give the information required by the beginner possessing a microscope. The volume by Mr. Garnett dealing with the commoner or more noticeable animals and plants which can be studied only by the aid of a microscope will meet a great need.

The greater part of the book deals with plants (chiefly Algae) and animals including Protozoa, Sponges, Hydra, Worms, Rotifers, Polyzoa, Crustacea, Water mites and Insects. Well printed photomicrographs of typical species will help in identifications.

The author has spent many years collecting and examining freshwater organisms and the information he has acquired is made available to his readers in a clear and entertaining manner. The meanings of unavoidable technical terms are either explained in the text or are given in a glossary. He tells of the many processes concerned with food capture, digestion, excretion, growth and reproduction and, what is more important he gives full directions on how to see these processes at work. There are suggestions indicating lines of original work which an amateur could undertake. Special chapters are devoted to equipment, the collecting and examination of living specimens, making permanent mounts with notes on suitable stains to use and useful formulae. There is a bibliography and each chapter finishes with a list of books for further reading.

There are a few slips which should be corrected in a future edition such as Plate XXXIII, *Rhincomesostoma* should be *Rhynchomesostoma*; Plate XLI (*e*), *Ancylus*, not *Anchylus*; *Shistostoma* (p. 192) should be *Schistosoma*; parthogenesis (p. 204) altered to parthenogenesis. On p. 150 the order of ciliary movement of Paramoecium is described as a ' metachromal rhythm ' when the word metachronal is obviously intended. The specific name *peregre* is given to our old friend *Limnaea*. Is this a mistake or have the taxonomists had another tilt at this unfortunate mollusc ?

In addition to the amateur microscopist this book will be of value to the teacher of biology as several ' types ' used in biological syllabuses are described with a wealth of practical detail. The aquarist, too, will find much useful information on rearing living food for his fish and will learn facts about some of the unwanted animals and plants which sometimes appear in numbers in his aquaria. The book is pleasing to the eye, pleasant to the touch and the type is easy to read.

H. W.

River Purification: A Legal and Scientific Review of the last 100 years, by **F. T. K. Pentelow.** Pp. 63. Edward Arnold & Co., 5/-.

This small book comprises the Buckland Lectures for 1952 and is in three chapters dealing respectively with the evolution of the law on the pollution of rivers, the effects of pollution on the biology of streams and the means available for rendering harmless the used waters of house and industry. It is a welcome book, for the recent re-organisation of River Boards on a system of watersheds should start a new era in the improvement of our many spoiled rivers and we have here a short defining, but with abundant references, of the scope of the problem. To the over eager the author will seem a pessimist but to those who know the difficulties that must be mastered before we can have sweet waters flowing through our industrial cities he is an optimist, for he closes his book with the thought that perhaps by the end of next century river pollution, except as an accident, will be a thing of the past.

Ll. Lloyd.

Charles Darwin and his Problems, by **Evelyn Cheesman.** Pp. x+166, with 10 illustrations. G. Bell & Sons, Ltd., 9/6.

This short biography of Darwin has been written specially for boys and girls of twelve and upwards. The voyage of the *Beagle* naturally occupies pride of place in the story, half the book being devoted to the famous journey. But the lively manner of presentation makes the account of Darwin's early years and of the years of toil which followed his return to England no less interesting. Boys and girls already interested in natural history will find this stimulating reading. They will surely

wish to read Darwin's own account of his voyage, and a note on the editions of this and his other works would have been a useful pointer for further reading.

Photograms of the Year 1954: The Annual Review of the World's Photographic Art. 59th edition, published on November 17th, 1953, for *Amateur Photographer* by Iliffe & Sons, Limited. Price 12/6 net, in linson binding (postage 8*d*.). Size 10″ × 7½″ (4to). 96 art plates plus 32 pages of introduction, criticism and articles interleaved with the section of plates.

The appearance of *Photograms of the Year* is an event of considerable importance in the photographic world for its pages contain a substantial selection—from an international field—of pictures representing the cream of the years' photographic work. Every phase of pictorial art and technique is represented and the quality of reproduction matches the high standard of the work depicted. The text of this year's issue includes critical comments on each picture by R. H. Mason, a résumé of the photographic work of the year by Bertram Sinkinson, and an article on early masters of pictorial photography by J. Dudley Johnston. Non-photographers will derive as much enjoyment from the artistry and beauty of these pictures as photographers will from the appreciation of those technical qualities which give them distinction.

***The Times* Book of Zoo Animals.** Pp. 4 letterpress, with 54 pp. plates. The Times Publishing Co., Ltd., London, E.C.4., 10/6.

The photographs which comprise the bulk of this volume were taken either at the London Zoo or at Whipsnade. The short preface notes the differences between the zoological garden and the zoological park and each of the photographs is briefly captioned. It is perhaps remarkable that the close-ups taken at the Zoo are the more compelling portraits while the pictures of animals more freely housed present them looking oddly out of place. The restricted depth of focus of the former softens out the bars.

The photographs are of that uniformity of excellence which conceals its own art and the production of the book is of an equivalent standard.

Poaching Down the Dee, by **Cledwyn Hughes.** Pp. 224, 8vo. Robert Hale, London, 1953, 15/-.

An introductory note explains that ' This book is a blend of experience and imagination.' There is no doubt in the reviewer's mind as to which is the predominant ingredient. Purporting to relate a poaching trip along the course of the Welsh Dee from above Bala to the sea, the author has produced a remarkable hotch-potch of topographical description, chit-chat and quotation, the whole freely interspersed with such hints to the would-be poacher as would move the most phlegmatic gamekeeper to paroxysmic laughter.

The author's own claim is to have ' had a mastery of skills and was a superior in the countryside ', along which ' there . . . I saw my first and only cuckoo ' strikes an odd note. The intending poacher will not be encouraged by the diverse equipment recommended. An inventory of the gear needed for poaching rabbits includes not only wire gins, purse-nets and long-nets but also ' one amicable ferret, lead and collar, pocket-knife for gutting rabbits, trowel for burying offal, one box with perforated holes (*sic*) to transport ferret, dogs, sacks, spoon-bladed spades, iron-bar grafts, etc.' It is the ' etc.' which may prove the most effective deterrent. Or, ' you can stand by a waterfall in the damp air where the ferns grow lush on the barks of the trees and you can there try and pluck a leaping salmon from the air '. You can try as he says, but perhaps you had better confine yourselves to catching eels in a pair of trousers filled with straw from which the catch is ' best extracted by inserting a bicycle pump and squirting air vigorously through the wet straw '.

Anglers will be surprised to learn that a more effective cast may be made by attaching ' metal ball-bearings bought from the local garage ' Surprised also would be the trout.

This is the most productive mine of misinformation and arrant nonsense which has so far appeared among the recent spate of ' nature-writing ' so much of which is written not *from* experience but *for* the market. But I suppose you can fool some people all the time.

E. H.

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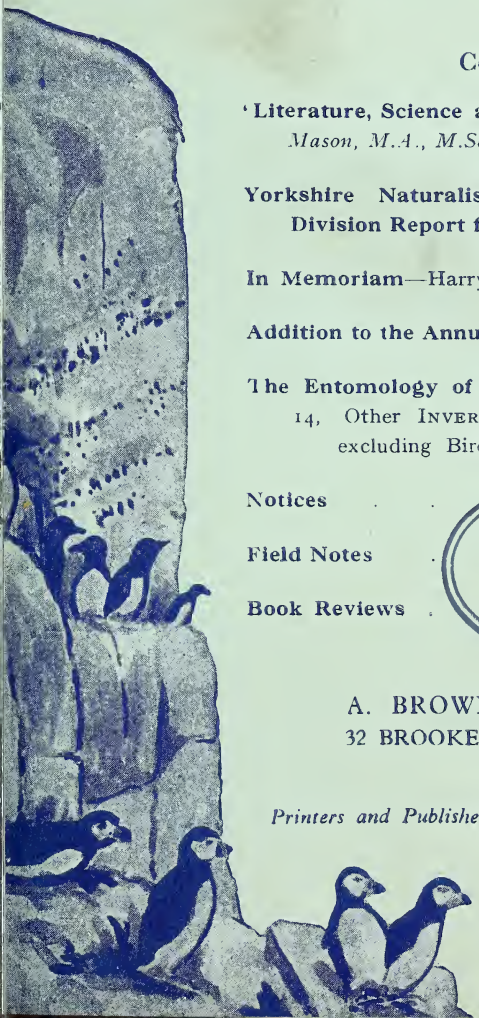

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' LITERATURE, SCIENCE AND THE NATURALIST '

E. W. MASON, M.A., M.SC., F.L.S.

Presidential Address to the Yorkshire Naturalists' Union, Halifax, December 5th, 1953

HALIFAX is, I suppose, the spiritual home of the Mycological Committee of the Yorkshire Naturalists' Union, for this town marks the western apex of that triangle of the world's surface from the productions of which, in 1801, the natural history of mycology was born. Between the years 1788-91, James Bolton published in four volumes *An History of Fungusses growing about Halifax*, and, to this day, that remains the only book on fungi in the English language ever to be translated into the German language.

The Mycological Committee has always been a relatively small one but is basic to the Union and in its time may be said to have made history. It has organised a succession of autumn fungus forays since 1881, and at its Selby foray in 1896, the British Mycological Society was generated, like so much else in Yorkshire, ' over a cup of tea '. Charles Crossland, a native of Halifax, was for many years Secretary to the Committee; he was one of the most active collectors of micro-fungi in the country, and his fungus herbarium, still in existence, illuminates innumerable bare records reported in *The Naturalist*.

Now as I am somewhat of a stranger in these parts, I will commence, if I may, by introducing myself as coming from Richmond, Surrey, and as working at Kew, Surrey. The name Richmond is usually unambiguous enough, although there really are two Richmonds, and also two Richmond Hills. But because a lass, unlike a fungus, is individual and indivisible, there can have been only one Lass of Richmond Hill.

But the distinction implied in the use of the name Kew, Surrey, is an altogether more material one; for not only in those places where naturalists are gathered together, but wherever the Queen's English is spoken and understood, as opposed to where it mourns in lowly exile among republicans and sinners—in the Queen's English the naked monosyllable Kew means one thing and one thing only, the Royal Botanic Gardens at Kew. The history of that venerable establishment goes back at least to 1762 when ' all the Duke of Argyll's trees and shrubs were removed to the Princess of Wales's garden at Kew, which now excels all others, under the direction of Lord Bute'. The name was made familiar to zoologists even before that date when the poet Alexander Pope presented the distinguished owner of the grounds with a dog, its collar suitably inscribed as follows:

' I am his Highness' dog at Kew,
Pray tell me, Sir, whose dog are you? '

In 1841 the gardens became national property, and what is perhaps the finest library for systematic botany in the world was initiated, together with a collection of dried plants which in the year 1937 was reported as having passed the seven million mark.

In the Kew Bulletin of Miscellaneous Information, 1915, the appointment was recorded of Mr. A. D. Cotton and Dr. W. B. Brierley as Assistants First Class in the new Pathological Laboratory of the gardens. In 1921 the Laboratory was transferred as an independent unit to Harpenden, Herts., and became the germ of the immense Advisory Service which now serves agriculture in this country.

In the same year, a new and small but independent organisation was established at Kew, Surrey. At first it was housed in the same quarters in the Gardens which were being vacated by the Pathological Laboratory; but ten years later a building of its own, so to speak, was erected on a patch of fenced-off land which was leased from the Gardens for a hundred years.

Unlike the Royal Botanic Gardens, whose name has not changed since its inception in 1841, and unlike the Yorkshire Naturalists' Union which is its own master, the new organisation has already been named three times; first called the Imperial Bureau of Mycology, it was later renamed the Imperial Mycological Institute, and later again the Commonwealth Mycological Institute. Now these three names are different names applied to the same thing except in so far as the object named has not remained exactly the same thing. For instance it has grown a little; at first there were three mycologists, now there are nine. Severe losses of irreplaceable personal knowledge have been suffered, first when the founder Director, Sir Edwin Butler was lost to the home Agricultural Research Council; and again in 1939 when

the second Director, Mr. S. F. Ashby retired at the beginning of the war, while he was carrying the full load of making identifications in the genera *Phytophthora, Pythium, Fusarium* and tropical so-called *Ceratostomella.*

The first and by far the most important function of the new organisation was implied by its first name, bureau, to assemble the whole of the current literature which illuminates or impinges on the science of plant pathology, to cite and abstract each book and paper, to publish the abstracts in its monthly journal, the *Review of Applied Mycology,* and to minutely index and cross index the contents of each volume.

A second and at first entirely subsidiary function was to undertake identifications not of course of British fungi on British crop plants, already so adequately provided for, but of fungi on crop plants overseas, and generally of microfungi that no one else would look at.

The justification of abstracting information from a man's book or paper derives from the fact that when he publishes and offers for sale in printed form matter known only to himself, it ceases to be his private property, and becomes public property; he cannot correct it, he cannot amend it, he has killed it dead; there it lies, so long as men can breathe and eyes can see. It is no longer a case of ' Mr. Richard Doe says ', it has become ' Doe, R. (1953) states '. It has become one more minute, but integral, scrap of literature. It will remain ' known to science ' even when it is not within the cognizance of any living scientist.

As is well known, scientists are becoming narrower and ever narrower specialists. What is not so generally realised perhaps is that zoologists and botanists have ceased to read one another's literature for so long that now they write two distinct languages based on two distinct grammars. This melancholy tendency has no doubt been aggravated by the torrent of contemporary literature. For instance, the roll of Journals, Bulletins, Circulars and Reports to be regularly seen for the one abstracting journal alone is already about 600; with an addition of perhaps fifty books to be cited. So much for literature.

The identification service for overseas material is a very different matter, as its concern is not limited to reporting published statements, but in some degree also to checking them. You will see the point at once when you consider a rhetorical question asked by Dr. Brierley the year before the service opened. It was as follows: ' When a number of specimens are examined and the statement is made that this organism is *Ustilago cardui,* and that organism *U. violacea,* what is the connotation of those terms '?

At a fungus foray, the words would have been spoken by one man to another, unless one of the naturalists present had started talking to himself. Two species names were being taken out of a man's head and placed in a finite sentence. By far the most important words in the sentence were the two demonstrative adjectives ' this ' and ' that '; when they referred to the two organisms that speaker and hearer could touch and see or put their fingers on. Some one was practising verbal nomenclature, by applying species names to concrete organisms one by one, practising nomenclature, not preaching it. He could have corrected himself immediately and no harm would have been done. It was Richard Doe speaking in the year 1920, not the words of Doe, R. (1920) dead and embalmed.

But let us pursue the matter further. Suppose that the two organisms were thrown away, as they so often were. The two demonstrative adjectives then ceased to demonstrate, and the two species names had nothing else to do but to go back into Mr. Doe's head. But suppose the organisms were kept; then the verbal nomenclature would be replaced by scripsit nomenclature, and the name written on a label would remain applied to the same object which on that occasion had been called *Ustilago cardui.* Now scripsit nomenclature is permanent enough, but unless placed in a public herbarium, it remains part of a man's personal property, and can be corrected. The owner may at any time even tear off the label and write another.

The moment, however, a particular specimen is referred to on a printed page, everything is altered. As the printed page cannot be withdrawn, the label on the specimen can no longer porperly be torn off or rendered indecipherable.

For thirty-two years the overseas service has been in existence; names provided in correspondence have appeared in printed matter round the Commonwealth. Most of the original overseas correspondents have retired or passed away; the staff at the Institute has also changed. But two things have not passed away: the printed

reports and papers in which the names appeared, and the actual specimens to which they referred.

The rooms where the work was done were from the beginning organised as laboratories. The overseas material arrived indifferently, either as living cultures or as pressed specimens of host plants. I remember the thrill I got the first occasion when I got a specimen to name of a species I had seen before; it was about fifteen months before it happend to me. But when it comes to learning species, fifteen months between specimen and specimen is too long. At that time, it was on one's business about the place to know any British fungi; they had been known ot science for long enough, had not they? On a morning in March, 1923, however, the Director said that as we now had three herbarium cases with not too much in them, British fungi could be picked up as met and incorporated, but not much in work hours of course. No sooner said than done; during the lunch hour, my first British Pyrenomycete was picked up under an avenue of horse-chestnuts, inspection of a host index showed that if it had previously been recorded from Europe on *Aesculus* it could only be *Eutypa lata*, and so into the herbarium with it before the whistle went. Pride, however, had come too soon. The next day the horse-chestnut avenue was visited again for more, the tree from which my stick had dropped proved to be not one of horse-chestnuts, but a solitary, intrusive sycamore, and my host index informed me that I could only have *Eutypa acharii*. So out the specimen came again.

That was the moment when I first realised the full implication of T. Petch's often quoted dictum that a mycologist must collect his own specimens and know them under all conditions, together with its obvious corollary that a name applied to a solitary collection is always suspect, and the longer the specimen remains solitary the more suspect becomes the name. This experience led to a systematic collection, at week ends and on annual forays, of English wood and bark Pyrenomycetes, on a natural history basis, that is playing the fungi against their substrata and the conditions under which each was found. The plan was to learn species by a direct comparison of specimen before worrying over much about species names.

Just as Mr. Petch by collecting over the classical grounds of Ceylon had found fresh examples of Berkeley & Broome's neglected species enumerated in their *Fungi of Ceylon*, so a modern collector in England would be sure to become familiar with the English species which had received a single mention in Berkeley & Broome's long drawn-out *Notes of British Fungi*. Although naturalists sometimes refer to this method as learning species the hard way, in my experience among microfungi, at any rate among those which have not been locally monographed, it is the only safe way. By 1939 I had about 1,300 collections of wood and bark Pyrenomycetes, sorted out pretty closely into species, some of them identified and confirmed by experts; the Hypoxylons by Professor J. H. Miller just after he had finished sorting out the North American species of *Hypoxylon*; the Diaporthes by Dr. L. E. Wehmeyer just as he had finished monographing the *Diaporthe* species of the world; the Rosellinias by Herr Kirschstein of Berlin, not so long after he had finished the *Rosellinia* species of the Flora Mark Brandenburg; the Diatrypellas by Dr. Croxall.

Now you may ask, what has this digression got to do with an identification service of overseas material of micro-fungi? The answer is that very few of these species mattered at all in themselves, but they served to provide a background against which species that did matter to correspondents could be placed. But more than that, they were supplying evidence that our herbarium species were being built up in the right way, because the natural history of the species was being introduced into the dry bones of their taxonomy.

However, the ground won was almost lost again. The Plant Pathology Committee of the British Mycological Society wanted a complete list of Pyrenomycetes recorded for Britain, and in 1940 that list was published. In it my carefully cherished list of wood and bark species names became swamped in a sea of leaf-, stem-, and dung-species names, the connotation of which meant nothing to me.

But fate was kind, for in 1941 another list appeared, Miss Wakefield and Dr. Bisby's list of Hyphomycetes recorded for Britain, which helped to inaugurate something of a revolution in our herbarium. It had never occurred to anyone to collect saprophytic Hyphomycetes as Hyphomycetes, as opposed to Hyphomycetes as a source of cultures or as the supposed conidia of Pyrenomycetes. However, in 1944 some of the first recorded British species suddenly appeared in my garden, in prime condition, alongside the dig for victory patch. It became clear that all the original Hyphomycetes must have been obvious enough to the eye to have been

collected at all, preparatory to becoming endowed with even a primitive description; and that they could all be recovered by systematic collecting in the same habitats just as the earliest species of British Pyrenomycetes had been recovered.

About this time another type of problem had to be met. From 1939 onwards, a considerable number of named collections were received from Uganda of fungi of a specialised type, superficial leaf ascomycetes often with many of their colonies overgrown by other ascomycetes, or coelomycetes or Hyphomycetes, representing the mycological equivalent of great fleas, little fleas and lesser fleas. As several primary parasites can, and often do, occur on the same leaf, and one envelope can contain many leaves, a number of species names, once as many as twenty, were written on a label; one envelope contained the type collection of four new species. Even homogeneous collections of the primary leaf parasites had to be handled with caution; for instance, in collections received from West Africa the name *Meliola* was being used to include the same range of species which were also being received from Uganda under the names *Meliola*, *Irene*, *Irenopsis* and *Irenina*. The question was how to incorporate such collections into the herbarium without losing the species.

But provision had also to be made for further developments. A culture collection of living fungi was to be started, and from its commencement it was considered important that the same species should be known both in the herbarium and in the culture collection by the same name. The staff of mycologists was to be increased, and again it was considered important that newcomers and old hands alike should use the same name for the same species. The common British Hyphomycete had to be found and become well represented in the herbarium; and as it was already known that many would be found under a number of different names provision had to be made for moving individual collections from species folder to species folder, and species folder from genus folder to genus folder again without losing them.

And again names current in the herbarium and culture collection should not be allowed to clash with names in frequent use in the *Review of Applied Mycology*.

Help was wanted all right and of a special kind, recalling, curiously enough, the far off days of Kitchener's army. Who was it then who knew by name and number every man in the company, his rank, his clothes, arms, equipment, pay, and where he could be found at any moment? Who but the Company Clerk, Nobby Clark, the man with a knob on his shoulders. Accordingly a mycological revolution took place, and a senior clerk, already with fifteen years' experience of indexing the *Review of Applied Mycology* was introduced into the herbarium itself, and things were never the same again.

The plan of campaign was formed with one eye on the current edition of the International Rules of Botanical Nomenclature, but with both on a small book by Sir Arthur Quiller Couch, widely circulated under the title of *The Art of Writing*.

The primary unit chosen for indexing was each individual collection or gathering as it was received. Each is entered on the left-hand page of the Accession book, first with its serial herbarium number, as a constant identification symbol distinguishing it from every other collection in the herbarium, and together with that, the bare particulars supplied on its label the country of origin, the collector, the host or substratum and any species name or names supplied with it. On the right hand page is shown the current disposition of its fungus contents into the species folders of the herbarium.

The immediate advantage accruing from a numerical index of the collections in a herbarium is exactly the same as that conferred by Linne when he introduced binary species names to take the place of the descriptive sentences by which species were formerly known. Every specimen of every species represented in the herbarium can be referred to without ambiguity by its accession number, the specimens themselves are the only things that certainly exist and continue to exist throughout several generations of mycologists.

The second index is an alphabetical list of species names in current use in the herbarium. Each is given a page to itself in the loose-leaf Fungus Book, and on this is entered the particulars of every collection currently disposed in the species, each with its accession number, country and substratum. The dispositions in the Accession Book must agree with the entries in the Fungus Book, and both with the contents of the species folders in the herbarium.

If a specimen is moved from one species to another species, or a species folder

is moved from one genus to another genus, the name no longer used is entered on a special misdetermination and synonym page, and the current name shown against it.

Two subsidiary indexes are also kept; first the mycologists' *pons asinorum* or host and substratum book, to ensure that different specimens of the same species on the same host plant do not carry two different species names at the same time, and an epithet index to ensure that no species in the herbarium is being inadvertently disposed into two different genera at the same time.

What may be termed this revolution in the herbarium methods followed on but some fifteen years later, the revolution in international botanical nomenclature. In 1930, names ceased to be the names of ' natural groups ' and became the names of ' taxonomic groups '; and as specimens cannot classify themselves into species, nor species into genera, the term ' taxonomic group ' can only mean ' taxonomic grouping ', and botanical nomenclature accordingly fell into line with the English language. No longer could a species have only one name in botanical science; in future the name a man must use would depend upon two things: what he is making up his species from (its circumscription) and after that the genus in which he is placing it (its position).

The simultaneous introduction of the type method of applying names provided an answer to Dr. Brierley's question ' What is the connotation of those terms (e.g. of the name *Ustilago violacea*). The answer is that on that occasion the speaker was restricting his application of the name *Ustilago violacea* to two collections, the one he was looking at and the type of the name. He was denoting a specimen by a species name, not explaining what the name connoted to him.

For many years before 1924 all smuts found in the anthers of any species of the family Caryophyllaceae were being almost universally classed in one species under the name *Ustilago violacea*. In 1924, however, Dr. Liro of Finland, divided them into ten species and so required ten species names, to cover the same ground.

It is impossible to overlook the resemblance between botanical nomenclature as it was referred in 1930, and English literature as it has existed for so many years. But the time has come to quote extracts from the words of Sir Arthur Quiller Couch which he first wrote in 1913-14 when science was still a thing apart.

' English literature is not a *hortus siccus*. Literature is an art to be practised, not a science to be learnt . . . Literature is a living art, therefore, it must be personal, and of its nature personal. In history, the impact is that of the personal or individual mind upon universal truth . . . Beetles, minerals, gases may be classified, and to have them classified is not only convenient, but a genuine advance of knowledge. But if you had to make a beetle as men are making poetry, how much would classification help? . . . Terms such as the Elizabethans, the Augustan Age, are handy, and we know more or less what they intend, but they cannot be scientific, precise, determinate as the terms inorganic, mammal, univalve, old red sandstone are scientific, precise, determinate. An animal is either a mammal or it is not: you cannot say as precisely that a man is or is not an Elizabethan.'

The term English literature is being used in a special sense, not to mean the *Bibliotheca anglica* itself, but the use the students are to make of the books to acquire the art of reading them on an author-reader basis so as to get everything out of every classic which its author put into it, and this with a view to acquiring the art of writing completely precise, unambiguous and persuasive English.

The distinction drawn between the writings of a historian, in which the reader has to understand his author and a naturalist whose terms are self-explanatory because they are scientific, precise, determinate, is now largely broken down. For natural history is still very largely an art to be practised, not indubitable knowledge to be learnt by heart. No one indeed has yet made a beetle but thousands of beetle species have been pretty much in the same way as men make poetry. How else pray did they arrive in literature? Not two by two, that is quite certain. Species names when properly used are scientific and precise, and can be used determinately as when applied to a circumscribed species, but are often used at large, that is without reference to any particular specimen or material.

The practice of concocting false homonyms of a name, very general in recent years—most of us have done it at one time or another—robs it of the precision that rules try to give it.

For instance, the name *Ustilago violacea* (Pers.) Roussel was first published in 1804. In recent literature references occur to *U. violacea* Fuckel (1860), Hazslinszky (1864), Körnicke (1877) and Schroeter (1877) although none of these later authors

ever proposed the name again as new, accordingly they are not homonyms, but mis-statements of fact. They refer to the same name applied to species with different circumscriptions; they do not refer to different names each proposed on its own type.

But now may I quote to you some writing about micro-fungi, this from Professor Sachs of Wurzburg: ' But the lower, the small and simple fungi, those especially which are parasitic on plants and animals, were the most attractive objects in the whole field of mycology. Here were difficulties in abundance, here were the darkest enigmas with which botany has ever had to deal, here was new ground to be won by extreme scientific circumspection and foresight. De Bary made it his first endeavour to perfect the methods of observation, and not only sought for the stages of development of the lower fungi in their natural places of growth, but cultivated them himself with all possible precautions, and thus obtained complete and uninterrupted series of development.'

Now here it is, sure enough, and from the words of a botanist too; he had something there, the difference in taxonomic approach between a naturalist among his collection of beetles, and another naturalist among his collection of micro-fungi. Beetles are found as discrete individuals, each with a form of its own that is recognisable under a lens, and each enclosed in a firm and durable exoskeleton, each accordingly an individual which does not lose its form or fall to pieces when it is collected and removed from its feeding ground. For the taxonomic-minded naturalist, accordingly, beetles are pure jam; he does not have to make a beetle, he finds it ready made; he does not have to isolate a beetle, he finds it ready isolated. He is working with a collection in which the unit is a beetle, a whole beetle, and nothing but a beetle, and he can get right on with his job of making beetle species which represent the truth, the whole truth and nothing but the truth, good luck to him !

The taxonomic approach of a naturalist among a collection of micro-fungi is altogether different. His specimens are not pure fungi at all; when found their bodies were inextricably entangled with their place of growth which is also their place of feeding, and which accordingly has also to be collected with them. All that can be observed on their outer form, which frequently reflects merely the physical condition or the anatomical constitution of their place of growth. It is not apparent how many individual fungi or how many species of fungi are present. Their identification must finally be confirmed with a compound microscope, and in order to do that, any microscopic parts which have become displaced may have to be put together correctly, not physically of course, but in the mind's eye.

There they are then; those beetles, each on its little pin, its place knows it no more; these fungi and their place of growth, dead and not divided. Relatively to a collection of beetles, a collection of micro-fungi is a naturalist's paradise, but the elaboration from it of fungus species inexorably good for all perpetuity is a very much slower operation. Happy is the man who can elaborate a single beauty.

However, to end where we began, Halifax is the district from which British mycology took root, and I cannot but think that James Bolton, Charles Crossland, and so many of their ilk would have delighted in to-day's gathering.

A Blackcap in February.—A female Blackcap sent to G. H. Ainsworth had frequented a garden at Patrington for three days during the cold of mid-February 1954, when very surely it would need food. It assumed ownership of a bird-table and successfully drove away Sparrows, Tits, Starlings, Blackbirds and Song-Thrushes. Blue-Tits she drove down to the ground stabbing them until the feathers flew. A pair of Robins were fought for fully five minutes until they left. After exhausting fights the bird would lie on a hedge with wings outspread, panting visibly. Evidently the Blackcap was making gallant efforts to stake a claim to the bit of ' territory ' on which cake appeared from time to time, as a Mistle-Thrush will do with a berry-bearing bush or section of hedge. Eventually the owner of the bird-table, who did not know the species, anthropomorphically decided the bird was ' vicious ' and must be killed so that other birds could share the food. To place the food at two or more places should have achieved the same object. A. Hazelwood said it was a very fat specimen—helped by a diet of cake? I think it likely that the bird was an autumnal immigrant which may have stayed under the influence of the mild winter (until mid-January).—R. C.

YORKSHIRE NATURALISTS' UNION (VERTEBRATE SECTION) ORNITHOLOGICAL DIVISION

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Hon. Secretary and Editor of Records:
Ralph Chislett.

Report for 1953

A year that has added a new species to the Yorkshire list of birds—the Yellow-billed Cuckoo at Cloughton in November—was not without distinction. 'Invasions' of Crossbills and Waxwings have occurred. Special meteorological features of the year include the northerly gales of late January that culminated in tidal inundations in the south-east, the severity that followed in February, the heavy rains of the Coronation period; and the mildness of the autumn that lasted until after the year end. Some of the effects of all these can be traced hereafter in the form of visitors to Eccup Reservoir and elsewhere, damage to black game in Baldersdale, and in the steady passage of migrants on the coast in autumn which was less interrupted by local conditions than usual. Space will not let me associate such matters in detail with the effects produced, but the facts and dates under the headings of species will speak for themselves to the discerning reader.

The *Handbook* order has been retained for another year for the sake of convenience at a time when personal handicaps reduced the time available for work—not merely from disinclination from following fashion. The writers of most regional reports seem to have accepted already as their motto 'the old order changeth, yielding place to new'. Do regional recorders of birds need to follow each alteration to the current views of systematists? We are more concerned with the living facts behind names and symbols. The new order in its turn will become an old one needing to be changed in the views of those who come after. Finality is beyond human power, but to secure a standard list of names of birds in our language that will remain should not be so. Standard British names would enable records to be kept alphabetically to serve successive generations, but unfortunately the systematists seem to feel entitled to try to change these too. Are not the British names of birds part of the English language? Our language grew with no strict regard for priority of publication; yet prior publication has claims for consideration. The name 'White's Thrush' is used in many books; is there a valid reason for changing it? Multiplicity of names has produced confusion enough.

The Spurn Bird Observatory

(By G. H. Ainsworth and R. Chislett)

Except for five days in mid-May, and three days in early October, both migration seasons were covered by observers, and many week-ends and other odd periods at other times. Spurn's amenities have suffered near to the Warren trap. New observatories have attracted a few of our supporters. That full cover at important seasons should so nearly have been secured despite our handicaps is rather remarkable. Nevertheless even the three days blank in October was unfortunate for comparative reasons, and whether anything of special interest happened then we do not know. So many people gave valuable time in 1953, not always conveniently, that to name any would be invidious.

The entomological party who have worked at Spurn for periods in several summers came again in July, but will be missed in 1954. G. R. Edwards conducted a course for members of the Junior Bird Recorders' Club (R.S.P.B.) in the week from August 15th and is to repeat it in 1954.

The number of birds ringed was down considerably. The Warren trap is less effective than before the two new bungalows were built but passerines still use the

Birds Ringed at Spurn

	Total for 7 years to 31/10/52	Ringed in 1952/3	Total to 31/10/53
Rook	1		1
Jackdaw	6		6
Magpie	8		8
Jay	1		1
Starling	359	109	468
Greenfinch	898	194	1092
Goldfinch	7	2	9
Siskin	3		3
Redpoll	3	2	5
Redpoll, Mealy	9		9
Bullfinch	1		1
Crossbill		4	4
Linnet	1374	94	1468
Chaffinch	802	174	976
Brambling	163	49	212
Corn-Bunting	1		1
Yellowhammer	56	3	59
Reed-Bunting	283	36	319
Snow-Bunting	1	100	101
House-Sparrow	1139	45	1184
Tree-Sparrow	19	1	20
Skylark	54	19	73
Rock-Pipit	2	2	4
Tree-Pipit	7	1	8
Meadow-Pipit	340	97	437
Pied Wagtail	2		2
White Wagtail	1		1
Yellow Wagtail	5		5
Great-Tit	40	6	46
Blue-Tit	75	1	76
Willow-Tit	2		2
Long-tailed Tit	3		3
Great Grey Shrike	3	1	4
Woodchat	1		1
Red-backed Shrike	2		2
Waxwing		1	1
Spotted Flycatcher	69	10	79
Pied Flycatcher	324	44	368
Red-breasted Flycatcher	7		7
Tree-Creeper	1		1
Goldcrest	181	12	193
Chiffchaff	50	4	54
Willow-Warbler	807	63	870
Wood-Warbler	8	2	10
Yellow-browed Warbler	3		3
Greenish Warbler	1		1
Sedge-Warbler	115	14	129
Reed-Warbler	2		2
Icterine Warbler	2		2
Garden-Warbler	57	2	59
Blackcap	30	1	31
Whitethroat	608	59	667
Lesser Whitethroat	32	1	33
Carried forward	7968	1153	9121

	Total for 7 years to 31/10/52	Ringed in 1952/3	Total to 31/10/53
Brought forward	7968	1153	9121
Barred Warbler	6		6
Fieldfare	18	2	20
Mistle-Thrush	1		1
Song-Thrush	358	35	393
Redwing	62	20	82
Ring-Ousel	8	2	10
Blackbird	1053	277	1330
Wheatear	58	15	73
Whinchat	91	8	99
Stonechat	11	5	16
Redstart	267	49	316
Black Redstart	24	2	26
Nightingale	4		4
Robin	978	23	1001
Bluethroat	2	1	3
Hedge-Sparrow	262	60	322
Wren	107	15	122
Swallow	137	29	166
Sand-Martin	34		34
Swift	2		2
Wryneck	7		7
Great Spotted Woodpecker	1		1
Cuckoo	80	4	84
Hoopoe	1		1
Long-eared Owl	3		3
Short-eared Owl	1		1
Little Owl	3		3
Kestrel	6	1	7
Sparrowhawk	14	2	16
Merlin	2		2
Sheld-Duck		1	1
Long-tailed Duck		1	1
Wood-Pigeon		1	1
Turtle Dove	1		1
Woodcock	4		4
Snipe	1		1
Dunlin	7		7
Green Sandpiper	1		1
Redshank	7		7
Oystercatcher	1		1
Ringed Plover	60	8	68
Lapwing		3	3
Little Tern	54		54
Guillemot	2	2	4
Razorbill	1		1
Corncrake	1		1
Moorhen	2	3	5
Common Partridge	4	1	5
Red-legged Partridge	10	10	20
Total	11725	1733	13458

shelter of our bank and bushes, although drives from west of the cottage are less successful. By the use of wheat as bait in the small traps, some of our hardier spirits caught 100 Snow-Buntings in the period January to March.

Weather conditions to hold up migration temporarily came very seldom in 1953. In general, migration was spread and mostly passed without many birds staying. Such was often noticed during the pre-breakfast drives to the Chalk Bank traps. One period of five days was anything but typical of 1953, but exemplified the effects of several types of weather, such as can happen at any time. Passage migration was often confined to early mornings. In the early morning of October 11th, *c.* 2,300 small birds, mainly Linnets but including some others, passed the ' narrow neck ' in 2¼ hours prior to 8-45 a.m., with winds southerly. On the 12th, from 3-30 to 5-15 a.m., J. Cudworth found turdidae were passing the lighthouse. Winds were still from the south, and *c.* 800 birds passed southward between 6-0 and 7-45 a.m. On the 13th the wind had gone northerly and increased to gale force during the day. The barometer had been falling steadily. At daybreak rain began to fall and numerous Redwings, Blackbirds, Starlings, Bramblings and Chaffinches came down for shelter. The 55 birds caught that day included a Ring-Ousel. Northerly winds prevailed on the 14th and again 55 birds were ringed including 27 Bramblings. Numbers caught on the 15th dropped to 26. By the 16th the wind had returned to southerly and early morning passage was resumed. Such interruptions to the steady migrational flow favour the Heligoland traps more than fine weather does.

Many birds were caught that had been ringed in previous years. A female Reed-Bunting of October 1950 was retrapped in October 1953 in company with a male and three juveniles. A female Cuckoo of August 1st, 1950, was recaptured in May 1952 and May 1953. Two Skylarks of early 1950 were trapped again in March 1953, one of them many times up to mid-July. Several Linnets and Whitethroats of previous years were trapped again. Recoveries farther away included a Robin of October 3rd, 1952, killed by a cat at Hastings, Sussex, on January 8th, 1953; a Songthrush of October 11th, 1951, that was in the Gironde Department of France on February 22nd, 1953; Blackbirds recovered in Barrow-in-Furness, Ireland, Aberdeen and Sweden; and Linnets in France.

To record the birds that pass is also part of our business. Among those watched at leisure in 1953, other than birds trapped, were Great Grey Shrikes, Shorelarks, Peregrine Falcon, several harriers of three species, divers, scoters, Black Terns a Sabine's Gull, Glaucous Gulls, shearwaters and crossbills, and always there are the various Waders and the flocks of migrants in their seasons. Details will be found in the ' Classified List '.

Whether the Spurn Peninsula should be made a ' Nature Reserve ' under the Planning Acts remains under consideration by the authorities concerned. Voluntary behaviour, control and voluntary supervision, authoritative control exercised by wardens, are all methods by which the Terns and other breeding birds could be safeguarded. Experience regrettably seems to show the last as the likeliest to be effective. Apparently people cannot be kept away from breeding areas without wardens, whether their intentions are to satisfy curiosity, to steal eggs, or merely to picnic at a quiet place. The question bristles with as many difficulties as there are interests involved—even world-politics affect many a secluded area to-day.

Early bookings for the cottage for 1954 are requested, so that the table of bookings can be prepared and the blank periods be known early, for filling by those less limited as to time. The good wishes of all her old customers will go to Miss Leonard, who has served us very well for eight years under difficult conditions. The café has been taken over by Mr. and Mrs. Codd who will continue to cater for meals.

The High Royd Trap (Halifax S. S.)

Halifax ornithologists are noticing the gap caused by the departure of G. R. Edwards for London. Brian Mitchell, too, has begun zoological studies at Birmingham University. The trap, however, seems to have done quite well, with Roy Crossley leading, and 495 birds were ringed. Included are 196 Willow-Warblers, 93 Greenfinches, 31 Whitethroats, 21 Tree-Sparrows, and 22 other species. The main trap has been repaired, and a member of the Halifax S. S. has presented a small caravan for use as a ringing hut. A number of birds retrapped had been ringed in 1952 and 1951. A Willow-Warbler ringed on August 14th, 1953, was retrapped at Scissett, Huddersfield, four days later (*c.* 14 miles S.S.E.), and gave an interesting sidelight on direction of movement. Other recoveries appear hereafter under Pied

Wagtail and Blackbird. Appreciation of the interest and co-operation by the manager and staff of the H. R. S. Farm is expressed by the Recorder, R. Crossley.

For the convenience of everyone, the numbers of Witherby's Hand List appear before the names of species and those of the new Check List in brackets behind.

Gratefully I have to thank my colleagues, and other contributors, for the material that has enabled this report to be written, and especially those, some of whose records have been crowded out, in some cases for reasons of space. To any whose names may inadvertently have been omitted from the following list of contributors I tender my apologies: A. F. Airey, G. H. Ainsworth, Miss P. Andrews, F. R. Allison, E. W. Aubrook, J. Appleton, A. Baldridge, K. Baldridge, Batley N. H. S., P. Baldwin, W. Bennett, P. G. R. Barbier, V. Belfield, T. D. Biseker, H. Boyd, H. Booth, C. G. Booth, K. Brown, I. G. Brown, H. W. Bracken, G. J. Brown, Bradford N. H. S., W. Bunting, H. O. Bunce, C. E. A. Burnham, W. A. Butterfield, E. B. Burstall, H. G. Brownlow, Bootham School N. H. S., L. Carr, G. Carr, Miss F. M. Cass, J. D. Craggs, E. M. Conder, A. P. Coote, R. W. Crosland, Miss F. E. Crackles, V. S. Crapnell, K. C. Crosbie, J. A. Chadwick, C. A. Cheetham, R. Crossley, F. Cooke, J. Cudworth, R. and A. L. Chislett, P. E. Davis, K. Dawson, A. C. M. Duncan, P. Dickinson, R. F. Dickens, Mrs. E. Dunning, G. R. Edwards, G. A. Ewbank, P. Evans, T. R. Earnshaw, J. C. S. Ellis, E. W. Ellis, M. Ellis, J. B. Fay, K. Fenton, J. K. Fenton, W. F. Fearnley, G. T. Foggitt, A. Frudd, I. J. Ferguson-Lees, H. G. Fisher, H. Foster, R. M. Garnett, F. C. and J. S. Griffith, Miss E. Gill, A. Gordon, J. R. Govett, A. Gibbs, A. Gilpin, W. Greaves, E. Grace, W. R. Grist, Mrs. E. Granger, M. and S. G. Green, Harrogate N. S., J. D. Hartley, Miss R. Harricks, A. Hazelwood, Miss M. Haydock, E. Hanley, O. C. Hill, H. Heald, A. C. Hoyle, E. Holmes, H. Hodgson, Halifax S. S., N. M. Hepworth, P. F. Holmes, W. Holmes, H. E. Holmes, D. K. N. Hillas, V. Huddlestone, G. E. Hyde, D. B. Iles, D. A. Illingworth, F. Jefferson, R. V. Jackson, H. Jowsey, F. E. Kennington, M. G. Kyffin, O. J. Lambert, J. M. Laws, A. C. Laughton, J. W. I. Leach, Miss A. E. Leach, J. C. Leedal, J. Lord, Leeds Bird-Watchers' Club, A. H. B. Lee, J. P. Lowis, J. W. Lund, Miss P. Lapper, W. K. Mattinson, C. W. Mason, A. Macallister, J. R. Mather, H. Marjoram, I. Morley, B. Mitchell, C. D. Milne, Lord Morpeth, C. Moody, J. B. Nelson, C. Nelson, W. W. Nicholas, D. B. Peakall, A. Pilkington, Mrs. O. M. Pennock, C. H. Potter, R. S. Pollard, G. E. Pringle, P. C. Quin, P. A. Rayfield, J. C. A. Rathmell, M. N. Rankin, E. H. Ramskir, C. D. Robinson, D. A. Rushforth, H. A. Robinson, P. H. Saunders, R. Slater, Miss C. Shaddick, J. C. Skinner, E. S. Skinner, D. R. Seaward, K. G. Spencer, Sedbergh School O. S., E. C. J. Swabey, J. R. Scott, P. J. Stead, Severn Wildfowl Trust Ltd., C. J. Smith, L. Smith, B. Sterriker, P. Swayne, J. K. Syers, E. W. Taylor, G. M. Taylor, M. K. Taylor, G. W. Temperley, A. Thompson, J. S. Trimingham, D. C. Urquhart, J. P. Utley, A. F. G. Walker, A. B. Walker, D. F. Walker, H. Walker, E. A. Wallis, A. J. Wallis, F. Wilcock, D. R. Wilson, G. R. Wilkinson, H. F. Woods, M. Wray, H. J. Williamson, C. Webb, T. W. A. Wood, Wakefield N. S., Miss C. A. Ward, S. J. Wells, A. Wells, C. B. Waite, B. Wrightson, Wharfedale N. S., M. Willoughby, R. F. Wormald, B. Winn, G. Wallis, E. W. Watson, G. K. Yeates, P. Young.

CLASSIFIED LIST

1. Raven (279).—Birds were seen in the north-west at all times of the year. There was no proof of successful breeding, but the eggs of at least two pairs were robbed. R. S. Pollard saw a Raven fly northward offshore at Cloughton on 1/1/54 as Herring Gulls mobbed it.

2. Hooded Crow (281).—The species was normal at Spurn with 17 on February 17th, two on April 29th, and one on July 12th (R.F.D.). The first of autumn came on October 8th (5). One had been noted on August 2nd. In the north-east the bird was scarce in the autumn, but eight were seen frequently in Rosedale in January by the keeper (H.O.B.). Elsewhere a few birds were reported at several places including one as far west as Widdale on the curious date of June 12th; later, a crow shot proved to be a hybrid (P.Y.).

3. Carrion Crow (280).—A young bird ringed by Sedbergh School on June 6th, 1952, was near Arncliffe on January 31st, 1953. Present at Spurn throughout the year with maximum of *c.* 40 on March 29th and April 7th.

4. Rook (282).—A Burnsall bird ringed on May 3rd, 1952, was near Northallerton on November 13th, 1952 (*British Birds*). A count of the Bradford rookeries (521 nests in 15 rookeries) showed an increase of 16 per cent. since 1947 (C.N.)

Three separate parties moving up-river at Methley on November 27th were probably immigrants (R.F.D.). At Spurn few occurred except in March and April (maximum 40 on April 13th), and in late October and November (62 on October 29th).

5. Jackdaw (283).—One ringed near Settle by Davis and Iles on July 10th, 1952, was at Birkenhead in March 1953. Jackdaws were less in evidence at Spurn than usual, but occurred at intervals throughout March and April and from October 21st. Soon after daybreak on November 29th *c.* 4,000 Jackdaws flew over the lake at Chevet (Wakefield), where up to 10,000 left the roost at 7-45 a.m. on December 6th with *c.* 500 Rooks. On subsequent mornings, numbers of daws were halved but the proportion of Rooks was higher (E.G., A.F.).

7. Magpie (284).—One young bird ringed, Horsforth, September 19th, 1951, was in Ravenstonedale, Westmorland, on June 17th, 1952 (*British Birds*).

8/9. Nutcracker (285).—R. Bramhill, in Wadworth Wood, near Doncaster, on September 6th, heard a continuous call ' karr-karr ' which was new to him. He traced it to a bird perched on a small tree, and when he imitated the call the bird flew towards him passing some eight feet above. Jackdaw-sized, the bird had rounded wings, was rich-brown in colour heavily flecked with white on breast and back. The dark tail had white edges. The bill appeared strong and the legs blackish. The bird was watched for half-an-hour at a distance of ten yards as it perched on a second small tree, and it was present thereabouts on the 7th, 8th and 10th. R.B. is certain the bird was a Nutcracker.

14/16. Starling (389).—The Bootham School N. H. Club and Mr. Clifford J. Smith have produced a booklet in which Starling natural history is summarised and considered, and are also responsible for the first seven items in the following culled from *British Birds*.

Ringed York 15/3/50 as adult, recovered Sztum, N. Poland 11/8/51.
Ringed York 29/1/52 as adult, recovered Vara (Västergötland), Sweden, 26/4/52.
Ringed York 3/3/52 as adult, recovered Vangsnes, Sogne, Norway, 4/4/52.
Ringed York 22/12/52 as adult, recovered Hareid, Norway, 2/4/53.
Ringed York 16/12/51 as adult, recovered Naerbö, S. Norway, 25/8/52.
Ringed York 10/12/50 as adult, recovered Elmshorn, Schleswig-Holstein, 29/6/52.
Ringed York 16/12/50 as adult, recovered Satrup, Schleswig-Holstein, 26/6/52.
Ringed York 10/12/50 as adult, by J. W. Brennan, recovered Bremen, Germany, 2/4/52.
Ringed York 23/1/49 as adult, by A. & M. White, recovered Hönefoss, Norway, 9/4/52.
Ringed Scarborough 7/11/52 as adult, by A. J. Wallis, recovered Moydow (Longford), Ireland, –/2/53.
Ringed Harrogate 1/12/52 as adult, by A. F. G. Walker, recovered Darley Dale, Derbyshire, 15/5/53.
Ringed Thornaby-on-Tees 23/1/51 as adult, by P. A. Rayfield, recovered Sieradz, Poland, 11/8/51.

A nest with recently hatched young was found in a wall at Pepper Arden on December 20th; they were not reared (J.P.U.). C. D. Robinson sends news of a large roost near Keighley in conifers at 1,029 feet altitude. Food pellets examined consisted mainly of vegetable matter, small snail shells and hard parts of beetles. Shed crop linings were also found in January, September and November. A roost near Farnham in the early months of the year was fantastically large containing many hundreds of thousands of birds (A.F.G.W.). Other large roosts were reported.

Numbers noted at Spurn fell away in late April, increased again in late September, and reached maximum from October 22nd, with *c.* 2,000 reported on the 27th. A boat coming into Hull on October 14th reported that large numbers of Starlings had settled on it in a strong east wind when two days off the German coast (J. Raddings).

An albino was reared at Haxby (F.J.).

18. Hawfinch (391).—Noted in its usual haunts and also bred at Westella, near Hull (L.A.G.).

19. Greenfinch (392).—A bird ringed at Monk's House, Northumberland, on November 2nd, 1951, was at Whitby on June 11th, 1952. Maxima at Spurn occurred in mid to late April and from October 10th to 26th. Inland concentrations occurred

as near Dewsbury S. F., *c.* 1,000, on February 1st (G.C.) just before the severest weather of the winter.

20. Goldfinch (393).—Four fed on thistles at *c.* 1,250 feet on Malham Moor on January 19th (P.F.H.). H. Hodgson described an increase in the Batley area as ' startling ', and in many districts the species is now on the increase. First and second broods were reared at Norwood Green (Halifax) (I.G.B.), the first record for the area for many years. There were *c.* 40 in alders and on thistles in Harewood Park on December 27th (D.B.I.). The word ' common ' is now applied to the species in several East Riding areas. A few were recorded at Spurn excepting during the period from May 1st to September 30th.

21. Siskin (394).—Not recorded at Spurn in 1953 and not many noted elsewhere, at either end of the year, but A. Gordon reported the species as usual in the Helmsley area. Generally parties were very small, but J. C. A. Rathmell recorded a mixed flock of Siskins and Redpolls of up to 120 birds at Knaresborough on November 2nd, and afterwards.

23/25. Redpoll (397).—Present in the breeding season in the usual places. The largest flock of the early months occurred near Blubberhouses, *c.* 50 on February 8th (A.G.), and of the autumn, *c.* 80-100 on October 4th near Harrogate, where *c.* 60-70 occurred on October 16th (A.F.G.W.). Two of a party of *c.* 30 near Chevet Park on October 18th were diagnosed as Mealy Redpolls (E.G.).

28/29. Twite (396).—In one western colony the birds were in good numbers and mostly hatched successfully (B.W.). In another a decrease is reported (E.C.J.S.). The species is not looked upon as rare in Baldersdale (J.R.S.).

30. Linnet (395).—Three Yorkshire-ringed Linnets reached France:

Ringed near Ilkley 7/6/52 by J. K. Fenton, at Orgueil, Tarnet Garonne, on 17/10/52.

Ringed Spurn 28/9/51, at Châtellerault (Vienne), on 7/1/53.

Ringed Spurn 25/8/52, at Bezons (Seine et Oise) on –/1/53.

Between 6-30 and 8-45 a.m. on October 11th, J. Cudworth watched passage migration over Kilnsea Warren and the Spurn ' narrow neck.' Of the 2,300 to 2,350 birds that passed in that time and were counted, the vast majority were Linnets. Fewer Linnets bred at Spurn than usual. Flocks were noted in inland areas in early spring—*c.* 120 at Dewsbury S.F. on April 19th (H.H.), *c.* 60 on April 18th between Blaxton and Wroot where passage was noticeable on April 3rd (J.S.T.), and *c.* 50 at Otley on April 25th (C.N.) In late summer, *c.* 500 that came to roost in greater willowherb at Ossett Spa S.F. on August 8th was the largest number noted (A.F., E.G.), and there were *c.* 300 at Knaresborough S.F. on September 5th (J.R.M.). Large numbers roosted in Batley Park in the winter months (H.H.). A Linnet's nest at Drighlington held four small young on August 30th, one being still in the nest ten days later (D.A.R.).

32/33. Bullfinch (401).—Reports of this species are typified by ' scarcity near Batley ' (H.H.) and ' increase near Sedbergh ' (H.W.B.). Seeds of stinging nettle appeared to be the food of four birds near Bingley on November 15th (C.D.R.).

36. Crossbill (404).—There was a widespread visitation of Crossbills in the summer months, when birds must have crossed the coast at various places. The story begins on June 19th when a male and two juveniles were seen on a road at Aldbrough, E. Riding (H. G. Fisher) and the question of breeding was raised, which, in view of what followed, seems highly improbable. On June 22nd a male was killed by a dog at Aldbrough and the specimen eventually reached G. H. Ainsworth and the Hull Museum. On July 5th, near Scarborough, an injured juvenile was caught, kept, and fed on ' canary seed ', and released on July 19th to join a party of *c.* 12 in some pines (A.J.W.). On July 6th four young and two adults were seen bathing in the Loftus Beck (N. East)—' since when I have seen flocks of varying numbers in the area " (Mr. Grainger, per R. Slater). Twelve occurred at Spurn on July 3rd, and G. H. Ainsworth was told by lifeboatmen and workmen that the birds had been more numerous during the last week of June when several juveniles were killed by cats.

Crossbills continued at Spurn in small numbers, with at least 18 on July 4th, and the last one on September 5th to 7th. Juveniles were seen by G.H.A. to feed on withered buckthorn leaves and thistle seed. The adults licked small insects with their tongues off carrot and hemlock flowers, and were often on the ground finding what they could at the base of the marram grass. Dead juveniles were found at the Warren trap drinking-pool. One bird used its bill parrot-wise as it climbed up the wire netting. Several were caught and ringed.

A female bird fed on thistles at the top of Bempton Cliffs on August 24th (M. N. Rankin).

Meanwhile birds were occurring inland. At least 15 flew over Harrogate on August 30th (A.F.G.W.). There were two on larch in Thornton Dale village on July 28th (R.M.G.), and others were reported by K. Green in various parts of Dalby forest and worked cones were found on Pexton Moor in early October. Small numbers were noted in autumn by A. Gordon in the Helmsley area. In the West Riding, four or five were noted near Swinsty Reservoir on July 18th (I.G.B.). There were several in Grass Woods, July 15th to 22nd (G. Charter), and *c.* 10 in Malham Tarn Woods on August 1st and the species was noted there until early September (P.L., P.F.H.). Five were at the lower end of Gouthwaite Reservoir on August 8th and up to nine remained in the neighbourhood until October 11th (A.F.G.W., A.G. and others). Fourteen were near Middlesmoor on October 11th (D. Swindells). Two were at Fairburn on September 19th (J.K.F., R.F.D.). Three had got as far west as Slaidburn by August 23rd (J.K.F.). On October 2nd I saw *c.* 10 in hillside conifers near Burnsall, Wharfedale. Three were at Fewston on November 8th (J.K.F.) and three in larches near Scotch Corner on December 27th (F. Cooke and K. Baldridge).

40/41. Chaffinch (407).—A dead bird sent from Spurn to A. Hazelwood on March 22nd was a ' well differentiated ' specimen of *F. c. hortensis Brehm.*, a race with type locality in Anhalt, Germany, which was admitted to the British List in 1948. A White Chaffinch appeared in Ilkley in November (M.B.). One ringed by Wharfedale Naturalists in September 1950 was retrapped in January 1951 and November 1953 (W.F.F.), and the ring of one bird was returned from Preston. Passage occurred at Spurn in late March and early April, and in late October when numbers were fewer than usual.

42. Brambling (408).—F. Jefferson recorded Bramblings as still present near Haxby on April 22nd. The last of a flock near Halifax, which had been dwindling since April 1st, was noted on April 20th (I.G.B.). The last eight of two large flocks that had wintered near Knaresborough were noted on April 19th (J.R.M., W.H.J.). At Spurn the last bird of spring occurred on May 1st, and the first of autumn on October 3rd, with maximum passage (*c.* 100) on October 14th.

43. Corn Bunting (410).—A bird that sang at Riffa during the summer was probably the most westerly record in the Dales country. At a spot near Cadeby where Corn Buntings had numbered *c.* 100 during the winter, *c.* 40 were still present on April 6th (J.S.T.). No flocks were recorded at Spurn.

44. Yellow Bunting (409).—In the Calverley Woods area a flock fed daily in January and February; 85 were caught and ringed (D.B.I., D.A.R., W.H.). On stubble near Batley on January 1st H. Hodgson estimated a flock at *c.* 200, of which only *c.* 50 remained on the 4th.

49. Cirl Bunting (415).—F. Jefferson noted the greenish head and dark bib of the male of a pair near York in spring.

55. Reed Bunting (421).—In a mixed flock of finches, larks, sparrows and buntings near Water Fryston on March 20th this species was the most numerous at *c.* 75.

59. Snow-Bunting (423).—As usual, Snow-Buntings frequented Teesmouth and Spurn in the winter months. Wheat proved to be an effective bait at Spurn and 100 Snow-Buntings were caught and ringed, the last were seen on March 24th. The first of autumn occurred at Filey on October 18th and at Spurn on October 26th. Parties were reported inland, including Ribblehead on January 6th (P.Y.), at Esholt on February 13th (C. Williamson), and north of Fadmoor during December. (E.W.T.).

62. Tree-Sparrow (425).—A pair nested near Shipley in a tree close to buildings where *domesticus* nested in numbers (J.C.L.). Flocks were at Ripley *c.* 50 on February 1st (A.F.G.W.), near Knaresborough *c.* 75 on March 6th (J.R.), and Keighley S. F. *c.* 80 on December 12th (C.D.R.).

69. Woodlark (271).—Heard and seen in several areas, especially in South Yorkshire. A Woodlark in the Halifax area on March 26th in company with two Skylarks (I.G.B.) was very unusual.

70. Skylark (272).—In the cold weather of February 15th a concentration on snow-covered ground near Chevet, Wakefield, numbered *c.* 750-800 (J.C.). On February 16th there were *c.* 250 at Stone Creek on the Humberside (W.A.B.). Up to 90 flew W.N.W. over Harrogate between 7-30 and 7-50 a.m. on October 7th (A.F.G.W.), and there was movement over Leeds on October 18th (R.F.D.). There

was an influx at Spurn on October 6th (*c.* 165) and 7th (*c.* 250), and near Filey on October 18th (A.J.W.).

72. Shorelark (273).—The five birds at Teesmouth on December 28th, 1952, were still there on January 18th (P.J.S.). Up to three were seen daily near to the Spurn Chalk Bank from October 17th to November 3rd, excepting on three days.

75. Tree-Pipit (376).—Two at Eccup Reservoir on April 3rd (H.W.), and one at Gouthwaite on April 12th (A.F.G.W.) were exceptionally early records.

76. Meadow-Pipit (373).—Parties occurred at Hornsea Mere on January 10th and 17th, and on March 21st (F.E.C.). Considerable northward passage was noted near Malham Tarn on March 23rd (P. Lapper). There were assemblies at Ossett Spa S.F. (*c.* 20 on March 15th), at Dewsbury S.F. (*c.* 70 on April 5th) (G.C.), on April 7th in a grass field at Farnley (*c.* 45), and at Lindley Reservoir (*c.* 50) (J.C.L.). About 60 flew N.E. over Bretton Park on March 31st, and *c.* 100 were present on April 8th. At Spurn a few birds were seen from February 17th with a gradual increase until late April. In autumn, the main passage took place from September 4th until early October with *c.* 300 as the maximum on September 18th, and passage in South Yorkshire covered the same period (J.S.T.), and at Fairburn (R.F.D.), and at Harrogate (A.F.G.W.). The largest autumnal flock (*c.* 150) occurred at Knaresborough on November 21st and 22nd (J.R.M.).

81. Rock-Pipit (379).—Birds were noted on the South Gare breakwater, one on April 16th, nine on October 11th, and about six have wintered there (A.B.). Eight were seen at Flamborough on August 26th (H.H.) and two at Whitby on December 28th (J.R.G.). At Spurn up to eight were recorded in late March and no more until October 10th, with *c.* 12 on the 12th.

88. Yellow Wagtail (382).—The first noted were at Barnoldswick, four on April 8th (A.P.) and one at Ossett Spa S.F. (G.C.) and at Spurn on April 9th. The build-up at Wintersett from nine on April 12 to 20 on April 25th, and 81 on April 26th (J.C.), was typical of other places such as Ossett Spa S.F. (E.G., G.C.). The species was first noted on the Ingleton Fells on April 25th (P.Y.), and in Baldersdale on May 8th (J.R.S.).

H. Walker described a *mutant* at Eccup on May 3rd as having a greenish mantle and grey-green crown and forehead. Passage occurred at Spurn from August 15th to September 25th with maximum of *c.* 20 on August 20th and 23rd. Inland movements in August and September were normal. On eight evenings from September 7th to 20th, J. Cudworth counted a total of 539 Yellow Wagtails as they passed down the Calder Valley, with 143 as maximum on the evening of September 17th. Late birds were: *c.* 20 at Fairburn on October 3rd (J.K.F. and A.E.L.) and one in the marsh near Ramsgill on October 18th (A.F.G.W., J.R.G.).

89. Grey Wagtail (381).—A pair were building in ivy above a stream in a garden at Masham on March 10th and the nest held six eggs on April 7th (J.W.H., R.C.). A Grey Wagtail and a Yellow Wagtail were reared from the egg by canaries in the aviary of F. Graham, Farmer, near Masham, eggs having been added to the clutches of the canaries. ' Dried insects ', supplemented by ' ant's eggs ', had been their food. On September 28th, with Mr. Graham anxious to release them, I ringed them and brought them down from the hill country to the riverside, where they mounted in the air and flew strongly down river. The long beaks of the wagtails often scraped the foreheads of their foster-parents as they were fed.

90. Pied Wagtail (380):

Ringed near Settle 9/7/52, by Davis and Iles, at Sandown, I. of W., 10/1/53.
Ringed High Royd 30/3/52, by Halifax S.S., at Grandola, S. Portugal, *c.* 11/2/53.

Probably a majority of this species winter outside the county. Up to twelve that flew up Gouthwaite Reservoir on March 8th seemed to be returning migrants (A.F.G.W.). Pied Wagtails and Meadow-Pipits were noticeably numerous moving through South Yorkshire near Doncaster on April 3rd (J.S.T.). Only a few passed Spurn. There was an albino bird at the East Park, Hull, on September 23rd (G.H.A.), and another near Malton and one seen several times in York Corporation Parks (F.J.).

91. White Wagtail (380).—Birds of this race were recorded on dates from March 22nd to April 26th at Swillington Ing (K.D.), Dewsbury S.F. (J.C., G.C.), Ossett Spa S.F. and Wintersett (E.G.), Healey (A.F.), Knaresborough S.F. (J.R.M. and J.R.), Batley (H.H.), Eccup (H.W.), Barnoldswick (A.P.) and at Swillington Ing on September 12th (G.C.) and Knaresborough S.F. on August 23rd (J.R.). F. Jefferson reported four on the lawn of Acomb Vicarage on September 24th.

96. Nuthatch (296).—A pair nested in a wall at Fountains Abbey (V. Belfield), nested in Roundhay Park, Leeds (R. V. Jackson) and near Bingley (C.N.) and elsewhere. A bird was seen at Slaidburn on November 29th (J.K.F.).

98. Great Tit (288).—A bird ringed at Sedbergh School on March 9th, 1952, was at Cottingham on April 6th, 1952 (95 miles south-east).

100. Blue Tit (289).—A bird in Shipley Glen was seen excavating a hole in an alder stump on May 2nd and was feeding young there on May 30th (C.N.).

108. Willow-Tit (293).—Bred in two places near Wakefield (E.G.) and at Skipwith (R.C.). Noted near Knaresborough (J.R.) and at Harrogate (A.F.G.W.).

111. Long-tailed Tit (294).—Parties were reported from many places, the largest numbers from about Hornsea Mere where F.E.C. noted *c.* 40 on January 10th and August 27th and M.K.T. saw *c.* 30 on October 18th, with *c.* 40 Blue Tits and five Great Tits.

114. Great Grey Shrike (384).—In the Scarborough area one occurred at Wheatcroft on March 18th, where it was said to have wintered, and one in Harwood Dale on September 20th (A.J.W.). Birds were seen at Spurn on October 7th, 12th, 19th, and from the 22nd to 27th. G.H.A. caught one by hand at 9 p.m. on the 23rd. Inland, birds occurred near Gouthwaite in February and March and November (A.F.G.W., J.K.F.), near Addingham on April 3rd (W.F.F., O.M.P., H.J.W.), near Leyburn on April 7th (K.B.), near Beckwithshaw on April 12th and 17th (G.K.Y.), near Cattal (Lower Nidd) on April 19th (C.S.), and near Wakefield on November 29th (J.C., E.G.).

120. Waxwing (383).—In the early part of the year six occurred at Scarborough on January 6th (A.J.W.) and on several dates in the Whitby area, with 19 at Sleights on February 12th as much the largest party (A.B.W.). There was one at Middlesbrough in early March (P.J.S.). Autumnal occurrences were rather more numerous and widely spread. Rather curiously the first were seen at Rishforth, near Halifax, two birds on October 20th (I.G.B.). A party reached the Albert Park, Middlesbrough, on October 26th with 15 there on November 22nd and more on the 28th and *c.* 12 on December 10th (O.C.H., P.J.S.). In the Scarborough district up to 40-50 Waxwings occurred from November 14th to 21st (R. S. Pollard, A.J.W.). There were three at Thornton Dale on November 12th and 18th (R.M.G.) and five at Runswick Bay on December 23rd (A.B.W.). A bird entered the Spurn Warren trap on October 30th (R.F.D., R.C.) and was considered to be an adult hen.

A small flock fed on haws near Harome (Helmsley area) on December 5th (A. Gordon) and three were seen at Drewton Dale on December 23rd (G.H.A.).

A Waxwing that was found dead in the Middlesbrough Park on November 30th was sent to A. Hazelwood, who, after consultation with Dr. J. M. Harrison, identified it as *Bombycilla garrulus centralasiae*, a very typical example of this pale eastern race of which seven specimens have previously been obtained in England, including one near York on January 18th, 1904 (see Bulletin B.O. Club February 1954, pp. 13-14).

121. Spotted Flycatcher (366).—Early arrivals were noted at Leathley on April 28th (D.B.I.), and at Driglington on April 29th (D.A.R.). On August 11th *c.* 20 associated with tits, creepers and Willow Warblers at Bretton Park (E.G.). Wings were removed from Small Tortoiseshell butterflies fed to a young bird at Bridlington on July 31st (F.W.). Two were noted at Bretton Park on September 22nd. A few passed at Spurn from May 17th to 22nd (six on the 19th) and from August 20th at intervals to September 26th (ten on the 23rd.). A bird ringed as a nestling on June 23rd, 1952, at Burley was found dead near Otley in late May 1953 (D.B.I.). One ringed at Spurn on 21/5/50 was at Epworth, Lincs., on 2/6/53.

123. Pied Flycatcher (368).—The earliest record was at Ripley on April 22nd (A.F.G.W.). At Ripley a male sang by a nesting-box in which Blue-Tits had nearly completed a nest on May 16th; on June 1st a hen Pied Flycatcher was sitting on six eggs in the box (A.F.G.W.). There were no spring records at Spurn. In autumn the first appeared on August 12th, but passage was small and spasmodic until September 6th to 9th (maximum *c.* 30 on the 7th), and again until September 15th (maximum *c.* 50 on the 16th); last seen one on October 12th. Two were at Bempton on September 5th (H.O.B.), and at least five in Hull from September 10th to 12th (F.E.C., G.H.A.), which fits with possible passage from Spurn up-river.

126/7. Goldcrest (364).—Numbers appeared to fall off in the Eccup conifers towards the end of March (A.H.B.L.). There were four at Spurn on March 25th and odd birds from April 8th to 12th. Breeding birds were normal. A bird occurred

at Flamborough on September 19th (H.O.B.). Odd birds were noted at Spurn from September 17th to October 27th, but passage noted was abnormally small. Four were at South Gare (Teesmouth) on October 15th (A.B.). J. R. Govett noted *c.* 30 at Eccup on October 25th and E. Grace found the species unusually numerous around Wakefield in late October and early November.

129. Chiffchaff (356).—A bird in the Sedbergh area on March 9th was abnormal as to date. Very few were noted at Spurn, the last being on September 12th. R.F.D. noted one at Fairburn on September 23rd.

132. Willow-Warbler (354).—A bird ringed at High Royd on August 26th, 1952, was retrapped there on August 18th, 1953 (R.Cy.). One ringed at Keyingham on 4/9/53 was shot at Talavera de la Reine, Toledo, Spain, on 11/10/53 (W.A.B.). The earliest was reported at Roundhay, Leeds, on April 6th (R. V. Jackson). Fifteen were recorded at Spurn on April 12th otherwise only odd birds were noted in spring, with the last on May 20th. Autumn passage began at Spurn on July 29th in small numbers, maximum 25 on August 21st, with the last single birds on September 27th and October 9th.

135. Wood-Warbler (357).—The earliest record was in Roundhay Park (where bred) on April 26th (J.R.G.).

145. Grasshopper-Warbler (327).—Nested at Bramhope and had young on June 17th (A. Gilpin) and no doubt nested around Thorne Moor where heard often (W.B.). Also heard near Malham (did not stay), Masham, Wakefield, Huddersfield, Ossett Spa S.F., Knaresborough, Sprotborough, Hornsea, Atwick, York, and Farnley Park where a pair were seen displaying on May 6th (A.H.B.L.). One occurred at Spurn on April 27th.

149. Reed-Warbler (333).—The species still sings from Scarborough Mere (E.G.) and Castle Howard Lake (R.F.W.) and at Kelsey Hill (K.F.) and Skipwith Common, and was heard at several points in the lower Aire valley from Fairburn to Swillington Ing, and at Bottomboat. The earliest record came from Fairburn on April 25th (R.F.D.). A bird sang at Sanwick Bay, Flamborough, on June 27th (K.F.). There were *c.* 20 at Hornsea Mere on May 3rd, where the last was noted on August 30th (M.K.T.).

153. Sedge-Warbler (337).—A bird had reached Wintersett by April 23rd (E.G.). The species was much fewer all the summer at Spurn than for some years, being first noted on April 28th, and last on September 15th. There was one on the South Gare breakwater on May 17th (P.J.S.).

161. Garden-Warbler (346).—A bird sang in a coppice on the Selby Road, Leeds, on April 12th (K.D.). Not noted at Spurn in spring, and in autumn only single birds on five days in August and September.

162. Blackcap (343).—April 17th was the date of the earliest singer at Harewood (R.V.J.). No spring records at Spurn; in autumn only single birds on September 16th and October 4th. One occurred at Wentbridge, December 10th to 19th (Mrs. E. Dunning).

163. Common Whitethroat (347).—The earliest inland appeared on April 23rd at Wintersett (E.G.), and at Ossett Spa S.F., where the last also was recorded on September 27th (G.C.). One was seen at Spurn on April 20th, with the last on September 24th; there were fewer birds there than usual.

164. Lesser Whitethroat (348).—There seemed to be extraordinarily few. I only noted the species twice, near Reeth at Whitsuntide, and at Collingham Bridge on June 13th (R.C.). E. Grace noted one in Bretton Park on May 5th. Birds were seen carrying food near Cloughton (R. S. Pollard). Single birds were noted at Long Riston on May 12th (F.E.C.), at Brandesburton on May 23rd (H.O.B.), a pair at Bridlington on June 13th (H.F.W.), and singing was heard in three places about Esholt in July (J.B.N.). At Spurn single birds on April 28th and 29th, and on May 18th, were the only records.

173. Fieldfare (302).—Flocks occurred in late April and into May—very large numbers (*c.* 2,000+) in a field near Wakefield on April 14th (E.G.), *c.* 400-450 in fields at Winterburn on April 25th (C.D.R.), and 249 at Gouthwaite on the 26th (A.F.G.W.). The latest were at Walton (J.C.) and Knaresborough on May 8th (H. Jowsey), *c.* 20 near Threshfield on May 9th (R.F.D.), one at Goldsbrough Dam on May 19th (J.R.M.), and twelve at Ossett Spa S.F. on May 13th (E.G.) and two on the 14th.

September records were—One near Thirsk on September 7th (N.M.H.), six on rowans in a Whernside gill on the 17th (P.Y.), fifteen near Hebden Bridge on September 21st (E.W.W.), and J.P.U. noted the species near Pickering on the 30th. Early

October brought five to Eccup on October 2nd (R.V.J.), one at Spurn and two at Teesmouth on the 5th (A.B.), several at Stocks Reservoir on the 6th (K.G.S.), on the 7th eight near Ledsham (K.D.) and *c.* 50 very tired birds on the top of Whernside (P.Y.), and by the 8th birds were arriving about Briscoe (J.R.S.). So the influx continued with bigger parties in mid-October—*c.* 400 over Middlesmoor on the 15th coming from north (D. Swindells per A.F.G.W.), *c.* 200 flew south-easterly over Cam Fell on the same day followed by a similar flock a few minutes later (P.Y.). There were *c.* 1,000 near Stocks Reservoir on October 18th (J.K.F.). Birds were still arriving in November—large numbers on the Wolds on November 8th (H.O.B.), *c.* 70 scattered over the South Gare area on November 15th (P.J.S.), and several there on the 22nd, and there were *c.* 200 at Spurn on November 6th and large numbers there on December 6th (H.O.B.).

174. Mistle-Thrush (301).—'The commonest Thrush around Sutton, Hull' (G.H.A.). A flock of *c.* 200 feeding on rowan-berries in a wood in Washburndale on August 9th (K.D.) was abnormally large. A bird at Flockton Moor, near Wakefield, on November 10th, was uniformly white, slightly tinged with grey; finches mobbed it (E.G.). A bird near Sleights had a white crescent across the throat (T.W.A.W.). One only occurred at Spurn, on September 25th.

175/7. Song-Thrush (303):

Young ringed Ackworth 1/6/52 by Ackworth School, Hourtin (Gironde), France 23/12/52.

Adult ringed Hebden Bridge 31/5/52 by Halifax S.S., Kirkbride, Cumberland, 28/9/52.

Adult ringed Saltee B.O., Wexford, 2/11/51, near Leeds, 12/4/53.

Adult ringed Spurn B.O. 11/10/51, near St. Ciers (Gironde) France, 22/2/53.

Young ringed Leathley (Nr. Otley) 11/6/52 by D. B. Iles, Diggle, Co. Kerry, 9/1/53.

Some passage birds reached Malham Tarn Woods on October 1st and many more about the 7th (P.F.H.). Only small numbers occurred at Spurn, maximum twelve on October 9th. Near-albinos were seen near Towthorpe and Easingwold (E.W.T.).

178/9. Redwing (304).—About 70 suddenly appeared at Spurn on January 5th, after which a few appeared intermittently until the last party (32) on April 19th.

The first birds of autumn (*c.* 50) were seen near Dent on September 19th as they flew south-west (P.Y.), and at Fixby, Huddersfield (E.C.J.S.) and Thornton Dale on October 3rd (R.M.G.). Thereafter records came from many places. At Spurn the species appeared on October 6th, with the maximum of *c.* 300 on the 8th and with further little rushes on October 13th and 14th, and from the 18th to the 23rd and from November 5th. Large numbers came off the sea at Thornwick Bay on October 19th (F.W.). Redwings passed over Leeds on evenings in the latter half of October until November 7th, when D.B.I. also heard passage over Guiseley. Large numbers passed over Leeds from 7 p.m. to 10-15 p.m. on November 16th (E.G., J.R.G.), when E.G. also heard passage over Ossett at 10-45 p.m., and J.R.G. heard some over Winn Moor at 11-15 p.m. More birds passed over Leeds in the night of November 28th (A.H.B.L.). Redwings came off the sea at Teesmouth on November 22nd (K. Baldridge). A concentration at Roundhay, Leeds, on November 28th of *c.* 800 birds included *c.* 50 Fieldfares. There were large numbers at Spurn on December 6th, some turning tide-wrack over (H.O.B.).

182. Ring-Ousel (307).—March 12th, Sedbergh (C. Moody); March 23rd, Gorple (J. Crossley per E.W.W.); and March 24th, Blea Moor (P.Y.) were the dates and places of the earliest records. On the Ingleton Fells a pair reared two broods in the same nest (P.Y.). On Rombald's Moor, in an area where birds were already breeding, five males and a female occured on May 17th and had passed on by the following day (J.C.L.). April 8th was the date of the only record at Spurn in spring. There was a male on Gorple Moor on September 30th (E.W.W.). Ring-Ousels were ringed at Spurn on October 13th and 14th. A male occurred at Filey on October 18th (A.J.W.).

184. Blackbird (308):

Ringed near Otley, as young, 9/5/51 by Davis and Iles, Castlewellan, Co. Down, 6/2/53.

Ringed High Royd, adult, 1/2/53 by Halifax S.S., Sjuntorp, Västergötland, Sweden, 16/7/53.

Ringed Spurn B.O., adult, 7/10/52 by Y.N.U., Echt, Aberdeen, 9/3/53.

Ringed Spurn B.O., adult, 12/11/52 by Y.N.U., Barrow-in-Furness, 18/1/53.
Ringed Spurn B.O., adult, 22/3/52 by Y.N.U., Cappoquin, Waterford, 11/2/53.
Ringed Spurn B.O., adult, 15/10/52 by Y.N.U., Buttevant, Cork, 10/3/53.
Ringed Spurn, juv. female, 3/11/52, Bjorboholm, 20 miles north-east of Gotland, 17/6/53.

Three successful broods were reared in one nest at Bridlington (F.W.). In spring numbers were greatest at Spurn on March 23rd and 24th (*c.* 30), but some earlier passage was evident, and numbers did not drop to summer level until the end of April. In autumn there was an influx on October 7th (*c.* 50) and 8th (*c.* 80) and again on October 13th, and from October 20th to 23rd, and on November 6th, and on December 6th many were turning over the sea-wrack, turnstone-fashion, in company with Redwings. At Ossett Spa S.F. on September 27th *c.* 30, mostly males, seemed exhausted (G.C.). At Bretton Park on October 27th, *c.* 50 fed with other thrushes and finches (E.G.). There were five at South Gare on November 19th (A.B.). Some were heard passing over Headingley after dark on December 5th (A.H.B.L.). At least 50 roosted in a plantation at Ossett Spa S.F. on December 13th, with Song-Thrushes and Redwings (E.G.). There was a white-headed bird at Horbury on November 17th (J.R.G.).

186. Wheatear (311).—Early records were—March 5th at Salterforth (J. K. Syers), and March 22nd near Shipley (J.C.L. and C.N.). At Spurn the first occurred on March 24th and birds continued to be noted until May 31st with maximum of 25 on April 12th and from July 11th to October 5th with a straggler on October 19th (maximum 20 on September 3rd, 4th, 6th, 7th and 15th). Nine were at Fairburn on September 9th (R.F.D.) and six on the 16th, and 29 were on newly-cut corn at Drighlington on September 13th (D.A.R.). Wheatears occurred at Cherry Cob Sands, and on the coast at Hornsea, Bridlington, etc., up to May 15th and from July 26th on various dates to September 23rd (W.A.B., H.F.W., etc.).

197. Whinchat (318).—A bird at Eldwick on April 19th, on its breeding grounds was exceptional (E. Jackman). Odd birds were at Spurn on May 8th, July 29th and 31st, and two on August 13th, and from August 20th a few daily until September 20th with maximum 14 on August 25th. Eleven at Knaresborough S.F. on August 31st were noteworthy (J.R.M.). Birds on Cherry Cobb Sands on September 1st and 6th and three at Stone Creek on the 18th (W.A.B.) were unlikely to have bred there.

198. Stonechat (317).—The species occurred—a male near Bingley on March 29th (C.D.R.), a male on Kelbrook Moor, Earby, on April 26th (J.K.S.). A female was at Bottomboat on July 17th (E.G.), a male at Horbury on October 3rd (G.C.), and one at Filey on October 18th (A.J.W.). At Spurn, single birds occurred in January and February and two on April 19th and no more were seen until September 30th after which up to four were noted daily until November 6th.

201. Redstart (320).—The first were seen at Huby near Harrogate on April 11th (J.K.F.). Lord Morpeth estimated breeding pairs on the Castle Howard Estate at *c.* 25. C. Moody counted over 30 pairs in the woods on the north side of Dentdale. Passage of males began at Spurn on April 12th and the species continued intermittently until May 10th. A male ringed there on July 3rd was in company with Crossbills. The next was seen on August 12th, after which odd occurrences only until September 4th, with ten on the 7th, numerous from September 15th to 19th, and intermittent occurrences until October 15th. In the same period odd Redstarts occurred about Hornsea Mere.

202. Black Redstart (321).—Single birds were at Spurn on March 24th, April 6th, 15th and 18th to 22nd. In autumn three birds occurred on October 22nd, and one or more were seen daily until the 29th.

203. Nightingale (322).—One sang at Runswick Bay from early May to June 1st (A.B.W.). Heard at Rossington, two males on May 26th and one on the 29th, and on June 8th (J.S.T.). Several noted east of Doncaster from May 11th (W.B.) and one in late May near Skipwith (H.O.B., C.E.K.) and one on May 25th at Little Weighton (D.C.U.). Occurred again near Wass.

205. Bluethroat (324).—A female was caught and ringed at Spurn on October 7th (H.J.W., G.H.A., O.M.P., J.A.C., A.H.B.L., J.R.M.).

207/8. Robin (325).—Ringed Spurn B.O., 2/10/52; Hastings, Sussex, 8/1/53. A Robin built an open nest in a box bush near Haxby (F.J.). None at Spurn from May 9th to August 12th, otherwise occurred intermittently in very small numbers.

210/11. Hedge-Sparrow (371).—Up to 17 at Spurn, January 1st to 5th, and a few daily onward to March 24th when ten daily until the 29th; a few noted on

most days, with notable numbers from September 22nd, *c.* 50 on September 24th and 25th down to *c.* 10 on and from October 10th. G. Carr considered a bird he caught at Ossett on October 3rd as possibly of the continental race from the longer 2nd and shorter 7th primaries and bright rufous upper parts and pale throat.

213. Wren (299).—Odd birds were about the Spurn peninsula until late May, and from mid-September to November with six as maximum on October 12th. A displaying Wren sang with raised, shivering, stretched wings and spread tail, often flicking one wing higher than the other as in Hedge-Sparrow's display (R.F.D.).

218. Dipper (300).—A survey by the Sedbergh School O. Society showed that 25 pairs bred in 15½ miles of river and 12 pairs on the becks of the open fell which had longer territories. Every nest overhung water. Linings were of leaves by the rivers and of grass on the fell becks. The first egg was laid on March 8th; 10 clutches were complete on March 31st. In a nest from which young flew on April 29th, the first of the second clutch was laid on May 2nd—an unusually short interval. Of 23 nests, 14 were used a second time, no new nest being built. Of 88 eggs, 67 per cent. hatched and flew, the wastage being mainly due to nest robbery (C. Moody).

220. Swallow (274).—The first were noted on April 3rd at Hornsea Mere (F.E.C., H.O.B.) and near Ossett (A.F.), and in the next few days a few Swallows appeared on the Nidd, the Wharfe, at Keyingham, Swillington Ing, Ripley, etc.

Sedbergh School O. Society located 121 nests out of 140 pairs observed in their area. Buildings containing animals and therefore some warmth seemed to be preferred, especially when clean and without cobwebs. Clutch sizes included one of seven eggs, four of six eggs, 79 of five, 41 of four,, 25 of three (C. Moody).

C. D. Robinson located a roost in Greater Reed Mace in August (for details see *The Naturalist*, 1954, p. 2). Other concentrations occurred at Ossett on August 1st (*c.* 400) which had gone on the next day (G.C.), and on August 6th *c.* 500 at Denaby Ings (J.S.T.). At Fairburn on September 8th there were *c.* 500 and on the 16th between 6-30 and 7 p.m. numbers increased from *c.* 100 to *c.* 500, apparently from north, nearly all of which were juveniles (R.F.D.). On September 19th large numbers (*c.* 2,000) came into Fairburn Ing, mostly juveniles, and with one white bird, some of which settled in reeds and on slag, but most passed down river (R.F.D., J.K.F., A.E.L.). Large numbers passed south over East Hull on September 26th (G.H.A.) and very large numbers occurred in various parts of the East Riding in August (H.O.B.). The main passage at Spurn occurred in May southward and in August to September, with the largest numbers from August 25th to 28th and on September 12th and 13th. Fifteen passed north on October 19th. Single birds occurred from October 31st to November 3rd, with two on the 5th. Almost all of these birds at both seasons moved southward.

The latest inland bird was near Bradford on October 23rd (I.G.B.).

222. House-Martin (276).—Eight birds about nesting-sites in Sleightholmedale on April 6th were very early (P. L. Gravett). The next occurrence about a nesting-site was at Gearstones Lodge, Ingleton Fells, on April 21st (P.Y.). My first at Masham arrived on the 23rd. Breeding House-Martins in the Vale of Mowbray appeared to be fewer than usual (J.P.U.) but some colonies elsewhere had their full complements. There were several at Sleights on November 8th and one on the 11th (A.B.W.), one at Bridlington on November 21st (F.W.), and one at Saltburn on the 29th (M. Ward per P.J.S.). Fewer birds seemed to pass at Spurn than usual and most moved southward at both seasons.

223. Sand-Martin (277).—Two birds at Spurn and one south of Bridlington (F.W.) on March 26th and *c.* 15 at Hornsea Mere on April 1st (M.K.T.), one at Staveley on April 3rd (C.W.) were the earliest records. On April 12th *c.* 200 Sand-Martins, *c.* 50 Swallows and a few House-Martins came up the Aire Valley near Fairburn between 10-15 and 12-30 (P.B.). There were *c.* 500 at Fairburn on April 25th (R.F.D., J.K.F.) and *c.* 500, including some Swifts and Swallows, over Ripley Lake on June 1st—a cold day (A.F.G.W.).

A. B. Walker recorded nests in a stone wall near Ruswarp mill. On July 3rd at 8-15 p.m., with low cloud above, *c.* 100 dropped low over the water at Fairburn and after hawking for five-ten minutes, suddenly rose to join another party moving down river. There were *c.* 200 at Horbury S.F. on July 27th (G.C., A.F.).

Numbers were arriving at Swillington Ing on August 5th from north-east; one flock of *c.* 100, after hawking for food, flew due south with wind W.S.W. (K.B.). There were *c.* 1,500 at Swillington Ing on August 16th (E.G.). Movements there were noted by J. R. Govett on August 18th—*c.* 300 at 12 a.m., *c.* 400 at 12-30,

c. 600 at 1 p.m., only *c.* 50 at 1-30, *c.* 400 at 2 p.m., *c.* 60 at 3 p.m., and *c.* 200 at 4 p.m. *Circa* 200 were there as late as September 20th (G.C.). Birds were last seen about a colony in Elland gravel-pits on September 23rd (R.Cy.).

About 600 flew south-west at Ossett S.F. on August 30th (G.C., A.F.). On September 1st, at Netherton above the Calder Valley, near Wakefield, south and south-westerly movement, with a few Swallows and House-Martins, was constant between 1-30 and 2-30 p.m. covering *c.* 2,000 birds and later parties passed south-west a mile down the valley (E.G.).

It is doubtful if these inland movements were connected with those on the coast; large numbers breed by the western rivers from the Swale southward. Miss Crackles noted hundreds roosting in the reed-beds of Hornsea Mere on August 26th on which date H. O. Bunce noted a small movement westward past Cherry Cobb Sands. At Spurn in late May passage was not large and was mainly southward. In autumn the main movements happened on July 28th-29th and on September 2nd-3rd. Six on October 10th were the last.

225. Swift (255).—Early appearances were noted on April 26th at High Royd (B.M., R.Cy.), and at seven other places in April. Arrivals continued well into May. By May 10th there were over 100 hawking over Wintersett Reservoir (J.C.). On the 11th passage over Lumley Moor was noted by A.F.G.W. On the 14th, *c.* 75 flew down the Aire at Fairburn (R.F.D.) and there were hundreds over the Wharf at Woodhall (R.V.J.). On May 17th, *c.* 1,000 birds, of which 80 per cent. were Swifts, and the rest Swallows and House-Martins, flew north-west at Teesmouth in less than an hour towards Hartlepool (P.J.S.). The spring passage at Spurn was not large, with the first on May 9th and was mainly southerly from May 17th to 22nd, and *c.* 30 on the 28th. Small parties passed northward (upwind) in Rosedale on May 21st (H.O.B.). In the cold on June 1st *c.* 200 hawked over Ripley Lake (A.F.G.W.). Movements in July were puzzling as usual. North-eastward was the flight direction of *c.* 400 at Apperley Bridge on July 1st (D.A.R.), and southward that of *c.* 400 at Dewsbury S.F. on the 26th (G.C., A.F.). Over Horbury S.F. *c.* 300 hawked on July 27th (G.C.) and *c.* 1,000 hawked over the Calder at Ossett (E.G.) where there were *c.* 100 on August 30th (G.C.). At Spurn passage southward took place on July 4th (*c.* 500) and *c.* 2000, passed on the 23rd, after which passage in small numbers continued through August, with a few in early September, and the last on the 29th. The last bird inland was seen at Swillington Ing on September 19th (C.N.). There were three at Bridlington on September 28th (Miss E. Willbourne).

227. Nightjar (252).—Bred at Skipwith, near Masham, near Hatfield, Thorne, Sedbergh, Bingley, Levisham and heard in other areas. The young of a first brood in the Hatfield area were flying in mid-July, and a second laying found on August 3rd, of which the young were on the wing by August 22nd (J.S.T.). Young Nightjars came to grief in the Masham area probably from stoat or weasel (R.C.). A female was picked up under wires near Austwick, freshly killed, on September 26th (W.K.M., C.A.C.).

232. Hoopoe (261).—A Hoopoe recorded on September 28th at Whitby remained about the harbour-side until October 1st (R.M.G., A.B.W. and Mrs. C.E.A.B.). Concerning a bird reported in Hull on April 15th an element of doubt as to identity remains.

234. Kingfisher (258).—Nested in normal numbers. During the autumn one occurred regularly at Stone Creek, but not in winter (W.A.B.).

235. Green Woodpecker (262).—One was seen north of Kilnsea on April 6th. H. W. Bracken reports an increase in the Sedbergh area. On October 31st a bird was observed perched in a hedge eating haws, a food not recorded in the *Handbook* (J.S.T.).

236/237. Great-Spotted Woodpecker (263).—On February 13th, with the ground snow-covered, one flew over Blea Moor from Dentdale toward Ribblehead (P.Y.). A bird was drumming at Cliffe on January 23rd (E.B.B.). Bred in suitable woods as usual. Occurred at Spurn on April 17th and October 7th.

238. Lesser-Spotted Woodpecker (264).—Bred in a rotten sycamore stump at Thornton Dale. From a few days after hatching the young were fed by the male only. Boring by the male began on May 12th and the young left the nest on June 27th (R.M.G.). The species has also been noted on various dates in the areas of Loftus, High Birstwith, Wharfedale, Swinsty, Masham, Bingley, Knaresborough, Harewood, Leeds (Roundhay Park), Apperley Bridge, Wakefield, Bretton and Hornsea Mere.

239. Wryneck (265).—Not seen at Spurn, nor elsewhere.

240. Cuckoo (237).—One near Batley on April 7th (H.H.) was abnormal; the next occurred at Houghton Woods on the 12th (E.B.B.). The last occurred at Spurn on September 16th (R.C.), a month later than the previous occurrence.

242. Yellow-billed Cuckoo (239).—A bird occurred at Cloughton from November 14th to 17th in and about the garden of E. H. Ramskir and was also seen by R. S. Pollard, E. A. Wallis, R.M.G. and others. For details see separate note in *The Naturalist,* April 1954.

249. Little Owl (246).—With records near Garsdale Head on October 15th (J.P.L., H.W.B.), and on Blea Moor on October 31st at an altitude of *c.* 1,200 feet (P.Y.), the species may almost be said to have covered the county.

250. Long-eared Owl (248).—Occurred at Spurn on April 9th, May 1st and August 13th. Bred east of Doncaster (W.B.). Noted near Keighley on March 15th (C.D.R.) and on the St. Ives estate on April 12th.

251. Short-eared Owl (249).—Breeding was proved near Thornaby-on-Tees (P.A.R.), in the Forest of Bowland (A.P.), in the Washburn Valley (G.K.Y.), near Everingham (J. W. Lund), and attempted near Aldbrough (E.R.) (E.B.B., G.H.A.), and birds were noted in so many places as to leave no room for doubt that the species is much more frequent, mainly in the breeding season, than (say) ten years ago. Noted at Spurn in late August, early September and in October.

254. Barn Owl (241).—No noticeable change in status. One was seen about the buildings of Sharpe's farm, Kilnsea, on January 1st and 2nd.

259. Peregrine Falcon (105).—At least two pairs on known breeding cliffs were robbed, but two young were reared at a third. There are many records of birds on the wing in the Dale country, one at Hornsea on May 17th (W.A.B.), one at Flamborough on September 5th (C.M.), one over the Goathland moors on December 28th (J.R.G.), and at Spurn in February, August and October.

262. Merlin (107).—At a 'dressing-site' on June 13th were remains of a number of emperor moths (P.Y.). Bred on a number of moors. Seen on Denton Moor on March 15th (K.D.), and arrived on the moors near Hury on March 22nd (J.R.S.). One flew westward up the Calder Valley at High Royd on March 29th (R.Cy.). There was a female by the Lockwood Reservoir on December 6th (P.J.S.). Noted at Horbury S.F. and Ossett Spa S.F. on November 11th, 15th (J.C.) and 28th (G.C.). At Flamborough a bird occurred on February 22nd (H.O.B., W.A.B.). At Spurn birds were seen on four dates in April, and on a number of days in September and October.

263. Kestrel (110).—

Ringed near Bradford, 25/6/52, recovered Long Eaton, 24/9/52.

Ringed near Bradford, 25/6/52, recovered Castleford, 13/9/52.

Passage was at the peak at Spurn from September 8th to 10th and on October 3rd and two were at Stone Creek on September 8th (H.O.B.) where none had occurred earlier.

269. Common Buzzard (91).—Three pairs nested, two broods were reared. A young bird with a broken wing was kept and fed on liver for three weeks, and released where found where it flew (H.W.B.). Odd birds were seen in other areas. A pellet from a nest consisted of two types of beetle, grit and grass, no bones (W. J. M. Hood per Sedbergh School O.S.).

Birds seen several times in August east of Leeds (F.J.), and three seen north of Fadmoor on December 24th (E.W.T.) may have been of the rough-legged species but identification was not conclusive.

271. Marsh Harrier (99).—A bird was mobbed by Herons and Carrion Crows for an hour at Hornsea Mere on August 25th and was seen on the 27th (F.E.C.). One occurred at Spurn on September 20th (R.C.).

272. Montagu's Harrier (102).—The species was seen east and west of the Vale of Mowbray in the summer months, with May 13th and September 14th as early and late dates. A nest found appeared to have met with disaster from flooding. A Montagu's Harrier at Spurn on May 5th showed an apricot breast scarcely streaked and may have been a first year bird. Rufous unstreaked underparts were also noticed on a bird at Spurn from August 27th to 29th (J.C.L., D.B.P., etc.). A bird probably of this species was reported at Skipwith in late May (F. Dean).

273. Hen Harrier (100).—A male bird occurred at Spurn on October 24th (R.F.D.). One, sometimes two, were seen in Rosedale in November and December. Two Harriers about the Danby moors for a few weeks before Christmas were pre-

sumably of this species (J. Lord). A female harrier at Leven on October 18th was probably of this species. A female stayed on an East Riding estate for several weeks in autumn, apparently living on snared rabbits, and was trapped in November (L.A.G.).

[275. Goshawk (94).—A large, broad-winged, long-tailed hawk, with a bluish tinge on the wings, flapped and glided over Ilkley Moor on April 25th ' like an overgrown or monster Sparrowhawk ' (P. G. R. Barbier). There is evidence that it might have been an escape.]

284. Osprey (103).—An Osprey at Castle Howard was seen on May 24th and on the 25th was watched for 45 minutes perched and on the wing. As it flew Jackdaws mobbed it (R.F.W. and Lord Morpeth). A bird was present at Castle Howard for a few days in mid-March (E.W.T.).

289. Heron (30).—Occupied nests in the breeding colonies were—Hornsea Mere 27 (F.E.C., B.S.), Scampston six or seven on April 3rd (E. M. Conder), Sleningford six or seven (R.C.), Whixley four (R.C.), Harewood 12 (C.N.) and one at the old site (D.B.I.), Healaugh 23 (A.G., G.W.), Ripley two (A.F.G.W.). Three nests near Fadmoor constituted a new heronry (E.W.T.). A nestling ringed at Ripley on June 11th, 1952, hit wires near Ilkley on December 29th, 1952. Birds in winter at Stocks and Gouthwaite Reservoirs and at Hornsea Mere were normal. There were ten on the Driffield beck on September 26th (F.W.). Ten were at Farnley Lake on July 3rd (J.R.G.). Reported breeding near Selside Moss needs confirmation (P.Y.). Birds were noted at Spurn on April 6th, and on several days in August and September.

297. Bittern (38).—A single bird was seen at Hornsea Mere on six days from January 4th to March 19th (F.E.K., F.E.C., B.S., etc.). One was flushed twice by keeper C. Richardson from the Dairy Pond at Castle Howard on January 12th. 1954 (Lord Morpeth).

300. Whooper Swan (85).—Noted at the usual waters at both ends of the year, with maxima at Wintersett on January 15th when 31 stayed for *c.* 15 minutes (D. Ayrton per J.C.), at Semerwater 18 on January 25th (K.B.), at Fewston 11 on January 11th (A.H.B.L.), at Swinsty 10 on January 18th and 12 on November 29th (M.W.), at Farnley Lake 12 on November 30th (P.B.), at Scargill Reservoir 8 on November 29th (M.W.), at Sprotborough Flash 7 on February 14th (J.S.T.). Gouthwaite Reservoir has had fewer than usual. There were two on Locker Tarn on February 28th (R. Harricks), 4 at Hury Reservoir in November (J.R.S.), and one on the Wharfe near Weardley on January 4th (A.H.B.L.). Two were at Hornsea Mere on February 14th (F.E.C.) and 22nd (K.F.). The latest were eight at Semerwater on April 7th (K.B.), and the earliest of autumn were seven birds at Semerwater on October 17th (J.K.F.) and a bird at Gouthwaite on October 18th (A.F.G.W.).

301. Bewick's Swan (86).—One flew in direction of Ilkley from Fewston on March 15th (K.D.). At Semerwater were five on January 25th and two on April 7th. There were five at Bottomboat on December 6th and 13th and nine on December 20th and 27th (J.C., E.G., etc.).

302. Mute Swan (84).—Thirty non-breeders at Fairburn kept in a flock all the season during which broods of nine and three were reared (R.F.D.). Forty-one birds were present on September 19th (J.K.F.).

303/307. Grey Geese (75-78).—Skeins were noted in many areas from January to March, and from September, with various directions of flight. Most of them were pink-feet, but of *c.* 600 that flew up the Trent at Trentmouth on February 21st, A. Gilpin was sure that the first five were Grey Lags from the pale shoulder-patches which none of the others showed. There were *c.* 800 at Faxfleet on February 22nd (A.H.B.L., J.R.G.). A large skein flew north past Hury Reservoir on February 19th (J.R.S.) and *c.* 70 flew northward over Snaingholme on February 28th (P.Y.). Five that flew easterly over Otley Chevin on April 10th were thought to be White-fronted Geese from their calls (P.G.R.B.). Two pink-feet were at Spurn on April 22nd (G.H.A.), one at Harewood with Canadas from December 27th, 1952, to April 12th (C.N., D.B.I.); and one at Gouthwaite on February 18th (K.B.) and one from April 19th to May 17th (A.F.G.W.).

Fourteen geese flew up-river at Hull as early as August 27th (C.E.K.). On October 3rd *c.* 35 flew south-westerly over York, and *c.* 50 eastward near Laytham on the 4th (F.J.), and also on October 4th skeins were seen flying eastward at Buckden (A.P.) and southward at Briscoe (J.R.S.). Counts in one Wolds area of evening flights in mid-October gave a maximum of *c.* 4,000, but Wolds flights seemed to cease early this autumn except for small numbers (C.E.K., H.O.B.).

Mr. P. Scott made a catch of 345 pink-feet in the Wolds on October 18th, 54 of them had been ringed previously—

In Iceland: four in 1951 and 42 in 1953.

In South-east Scotland: one in October 1950, one in 1951, and one in November 1952.

In the Wash: three in October 1952 (one of them also recaptured in Iceland 1/8/53), and one on October 14th, 1953.

In the Wolds: one in October 1952 (also recaptured in Iceland on July 29th, 1953) (H. Boyd, Severn Wildfowl Trust, per H.O.B.).

Two Pink-feet shot near Brough on October 12th, 1953, and in November, and one near Broomfleet on December 8th, 1953, had all been ringed in Iceland in July 1953 (P. B. Oughtred and Severn Wildfowl Trust).

312/313. Brent Goose (80).—Five flew westerly past Winshaw (Ingleton Fells) on January 12th (P.Y.). There were two pale-breasted birds at Hornsea Mere on February 2nd and 21st (K.F., F.E.C.), and one on the 14th and 15th (F.E.C., F.E.K.). Six dark-breasted birds were at Spurn from March 12th to 22nd, one on the 24th, and two on October 14th and 15th.

314. Canada Goose (82).—In the Swinton (Masham) area on several waters the population by mid-summer numbered *c.* 190. Some 15 broods had been reared, including two apparently of eleven and sixteen, totalling to *c.* 80 goslings, with the inference that *c.* 80 adults out of 110 did not breed. Also bred at Bretton Park six pairs (E.G.), at Gouthwaite two pairs, at Ripley five pairs, at Studley Royal three pairs (A.F.G.W.), at Harewood three pairs unsuccessfully (D.B.I.). Some remained in the Swinton area until the year end, but vanished with the severe weather of late January. Concentrations included 99 at Bretton Park on March 10th, *c.* 100 at Ripley on September 6th, and 220 at Harewood on December 24th (R.V.J., J.R.G.) which probably included birds from Eccup, Washburndale waters, Ripley, and the Swinton area and perhaps elsewhere. Gouthwaite Reservoir had many fewer in autumn than usual; from December 13th there were none (A.F.G.W.). *Circa* 100 at Malham Tarn that flew south on January 10th was interesting (J.R.G.). Seventy-seven flew south-west over Ossett S.F. on October 18th (J.C.).

315. Sheld-duck (73).—The species occurred at Eccup in March and May, and in May at Swillington Ing where breeding was recorded a few years ago. In autumn, Dewsbury S.F., Ossett S.F., Swillington Ings, Knaresborough S.F., Gouthwaite Reservoir, Eccup Reservoir and Sawley Fishpond were places where Sheld-ducks were noted.

Frequently noted along the Humberside at Stone Creek where one adult accompanied 20 juveniles on August 1st (W.A.B.). On July 19th, 85 flew east (J.M.L.) and 40 on the 26th (W.A.B.). At Cherry Cobb there were 60 adults on July 7th (W.A.B.) and on August 7th two young accompanied by two adults were still in late down (K.F.).

Birds were trapped on successive days at the entrance to a rabbit burrow on Hotham Carrs. The burrow held eight eggs which were hatched under a hen and eventually flew (E.B.B.). One got into a farmer's rabbit snare at Spurn and was ringed. Always present at Spurn—*c.* 50 on April 26th; 24 flying south at 6-30 a.m. on July 4th; 33 flying south-east at 1-30 p.m. and 46 flying east at 9-15 p.m. (J.C.L.) and 30 flew east on July 21st. Fifty on October 29th was the largest number noted in autumn.

317. Mallard (45).—The figures for duck-counts that have reached me show the waters of Hornsea Mere with maximum of *c.* 1,500 on November 21st (F.E.C.) and Eccup Reservoir with maximum of *c.* 1,450 on November 22nd (H.W.), as the waters visited by most Mallard, with Swillington Ing next and Leighton and Roundhill Reservoirs jointly not far behind. The pattern is similar at all waters used as daytime sanctuary, viz: large numbers in January and February, a falling off in March, and small numbers through the breeding months until the autumnal build-up begins in August.

318. Gadwall (49).—This species was noted on May 4th at Denaby Ings (J.S.T.); a male at Fairburn on June 13th (J.K.F.), one at Swillington Ing on September 13th (J.C., A.H.B.L.), a pair at Fairburn on November 28th (R.F.D.) and three at Stocks Reservoir on November 28th and 29th (J.K.F.) and four at Farnley Park on November 15th (A.G.).

319. Teal (46).—The largest numbers of this generally distributed and migrant duck were reported from Swillington Ing, *c.* 500 on January 4th (K.D.) and February

15th (A.H.B.L.) and *c.* 600 on November 29th (A.H.B.L.). About 350 came in there at 10-30 a.m. on September 6th (E.G.). At Hornsea Mere, F.E.C. reported *c.* 500 on February 15th. Elsewhere numbers were smaller but normal for the waters concerned.

322. Garganey (47).—Four occurred north of Kilnsea on April 19th and 20th. There was a pair at Hornsea Mere on March 29th (F.E.K.) and a male on April 3rd, 7th and 11th (F.E.C.). Two males occurred at Denaby Ings on May 2nd to 4th, and two on July 25th (J.S.T.). A. C. Laughton noted a bird at Altofts on May 1st. At Fairburn and at Bottomboat birds were present throughout the breeding season (R.F.D., E.G.). Nowhere was breeding proved.

323. Wigeon (50).—Maxima were *c.* 200 at Stocks Reservoir on March 7th (J.K.F.), *c.* 200 at Swillington Ing on January 9th (K.D.), *c.* 241 at Eccup on November 29th (H.W.), *c.* 350 at Bottomboat on December 13th (G.C.). Smaller numbers were recorded for many other waters. Five at Fairburn on May 4th (M.N.R.) were late and one at Denaby Ings on August 18th (J.S.T.) and three at Stocks Reservoir on August 23rd (J.K.F.) were early. At Spurn there were *c.* 300 on January 3rd, and the autumnal build-up had reached *c.* 300 on October 29th. At Hornsea Mere there were *c.* 500 on January 17th and the last there on April 25th; first seen on August 28th, *c.* 20, and by November 28th there were *c.* 140 (F.E.C.). At Cherry Cobb Sands, after the first had been seen on August 30th, there were *c.* 400 on September 29th (J.M.L.).

325. Pintail (52).—Occurred at Hornsea Mere, a pair on January 4th (F.E.K.), and on February 7th and March 21st (F.E.C.); at Eccup Reservoir up to four on dates in January to April 12th; at Swillington Ing in the early months up to April 19th, with five on April 7th (G.C., J.C.); at Fairburn on March 1st (I.G.B.) and at Bottomboat up to April 21st (E.G., A.F.). In autumn occurred on the same waters in similar numbers from October 3rd, and at Coniston Cold (C.D.R.), Swinsty, and Copgrove and on the Humberside, with 30 at Cherry Cobb on September 27th (H.O.B.) as much the largest number anywhere. Two were at Spurn on September 29th.

326. Shoveler (53).—Noted in the breeding season at Summer Lodge Tarn (K.B.), Denaby Ings (J.S.T.), east of Doncaster (J.S.T.), Bottomboat where bred (E.G.), Fairburn (R.F.D.), Gouthwaite (H.J., A.F.G.W.), and probably bred at several places. In autumn noted on many waters, especially at Eccup where by far the largest number anywhere occurred on November 15th with 116 (H.W.). Two were at Spurn on April 3rd, 18th and 24th.

328. Pochard (57).—Usually some in the winter months on the larger waters and smaller waters visited occasionally—Maxima, Fairburn, *c.* 150 on March 11th (R.F.D.); Swillington Ing, *c.* 60, on January 25th (K.D.); Gouthwaite, 44 on October 25th (A.F.G.W.); and Hornsea Mere, 45 on November 7th (F.E.C.). Bred at Fairburn as usual (R.F.D., J.K.F.) and at Allerton Bywater.

330. Tufted Duck (56).—Nested by Fly Flatts Reservoir (B.M., I.M.), Fairburn Flash (R.F.D.), Farnley Lake (C.N.), Swillington Ing and Bretton Park (E.G.,) Staveley Gravel Pits (C.W.), Ripley Lake and Gouthwaite (A.F.G.W.) and at other places. Frequent on most sizeable waters with maximum of *c.* 250 at Fairburn on March 11th (R.F.D.).

331. Scaup (55).—A flock of *c.* 100 occurred off Spurn on October 26th (R.F.D.), five along Coatham Sands on November 8th (P.J.S.), at Fairburn two on October 3rd (J.K.F.), at Gouthwaite a female on October 18th and after (A.F.G.W.), one at Bretton in November and December, a female at Swillington on August 3rd (A.G.), one at Malham Tarn on October 25th (A.G.), and a drake at Swinsty on December 28th (E.S.S.).

332. Goldeneye (60).—A very late bird displayed vigorously at Grimwith Reservoir as a pair of Mallard passed it on May 25th (C.D.R.). From October 10th, when two appeared at Fly Flatts Reservoir (C.D.R.), the species was visible on numerous waters mostly in small numbers. Maxima were 23 at Swinsty Reservoir on March 1st (J.C.L.), 32 at Gouthwaite on November 29th (A.F.G.W.).

334. Long-tailed Duck (61).—From October 29th one (K.G.S.), and from October 31st to December 8th, two occurred on Stocks Reservoir (A.P., J.K.F., E.S.S.). At Spurn on October 28th, after a severe gale, a tired bird was caught by J. Parker and ringed (R.F.D.). A male was seen from South Gare, Teesmouth, on November 8th, several having been seen on the Durham side (P.J.S.), and two were seen from South Gare on November 19th (A.B.). There were two off Bridlington

on March 1st (A. Gibbs) and three on March 9th (M.G.K.) and a male below the Whitby East Cliff from December 6th to 28th (J.R.G.).

337. Common Eider (67).—At Teesmouth on April 16th a male (A.B., K.B.), two females on November 19th (A.B.), a female off South Gare on December 13th, and four on December 27th (P.J.S.), a male off Redcar on December 27th (P.J.S., A.B.), and two ducks below the East Cliff, Whitby, on December 28th (J.R.G.).

339. Common Scoter (64).—As usual noted not rarely on the coast—off-shore, at Spurn, *c.* 200 on July 12th, *c.* 400 on July 17th, *c.* 200 on October 25th; off Whitby, *c.* 120 on December 6th (P.J.S.) and *c.* 350 on December 28th (J.R.G.); off Hornsea, *c.* 150 on August 2nd (R.F.D.); and *c.* 70 off Mappleton on July 31st (K.F.). At Stone Creek were *c.* 100 on May 30th (W.A.B.). A few occurred inland—a pair at Eccup on April 12th (C.N., H.W.), and at Wintersett on April 5th and May 6th to 8th (J.C.), two males at Eccup on February 14th after a blizzard from east, one at Stocks Reservoir on July 5th (A.P.), one at Eccup on September 2nd (Mrs. E. Granger) and on the 6th (C.N.), one at Ogden Reservoir on October 24th (I.M.), three at Gouthwaite on November 15th (A.F.G.W.) and one at Bretton Park November 24th-December 1st (E.G., J.C.).

340. Velvet Scoter (62).—Three were off Flamborough on February 1st (D.B.P.). The species was recognised at Spurn on April 27th, and several in early October. Two ducks were close inshore at Gristhorpe Bay on November 7th (A.J.W.) and one occurred off Teesmouth on December 27th (A.B.).

342. Goosander (70).—Noted on Hornsea Mere and on most waters north of Airedale in varying numbers, and odd birds south of Leeds, at Swillington Ing in early February (K.D.). Maxima were at Stocks Reservoir, 97 on March 18th including 30 males (C.N.), and *c.* 84 at Eccup Reservoir on March 15th including *c.* 28 males (D.B.I.). The latest occurred at Eccup on May 3rd (C.N.) and the earliest at Gouthwaite, a male on October 11th (A.F.G.W.).

343. Red-breasted Merganser (69).—Three occurred at Spurn on April 19th (D.B.I.) and at Eccup on April 12th (H.W.), two at Blackmoorfoot on October 3rd (E.C.J.S.), and a female at Castle Howard Lake in December (Lord Morpeth). At Hornsea Mere, two females on January 10th (F.E.C.) and a pair on February 14th-15th (F.E.C., F.E.K.).

344. Smew (71).—At Gouthwaite a single male and one or two females were usually noted in January, February and March (A.F.G.W.) and a male remained until April 4th (A.F.G.W.). In autumn after four redheads on November 15th and three on the 22nd, a male and a redhead occurred from November 29th to the year end (A.F.G.W.). Two were at Harewood on February 4th and 22nd (D.B.I.), a male at Malham Tarn on March 7th and 17th (P.L.), and two birds at Stocks Reservoir on December 29th (J.K.F.).

346. Cormorant (28).—Miss F. E. Crackles noticed a bird at Hornsea Mere on February 14th that showed the characteristic head pattern of the Southern Cormorant *P.c. sinensis* (Shaw and Nodder) and plumage details were confirmed on the 15th by H. O. Bunce and F. E. Kennington. On April 3rd five were present, numbers dwindling to one on April 16th (F.E.C.) and one on May 3rd (M.K.T.). All the time typical Cormorants were present about the mere and many people noted the unusual birds. Generally it was difficult to see any gloss on the plumage but H. O. Bunce noted one bird glossed green on the breast on April 3rd. Cormorants reached their maximum at Hornsea Mere with 50 on February 12th. Birds decrease and may often be seen to fly seaward in late afternoon (F.E.C.) and M. K. Taylor suggests they fly up the coast, possibly to the Flamborough area, returning to the Mere after dawn.

The usual odd birds occurred inland on various dates. A bird picked up near Halifax was ringed and released at Blackpool on February 21st; a month later, on March 22nd, it was caught at Llangefri, Anglesey (R.Cy.). At Eccup on April 4th, and at Roundhill Reservoir on September 6th, Cormorants were seen to leave the water with laboured flight and rise in ever heightening and very wide circles until at a great height each bird made off W.S.W. (K.B., R.C.). *Two* immature birds at Wintersett on May 14th were unusual (J.C.).

348. Shag (29).—There is strong presumptive evidence of breeding at Flamborough. H. O. Bunce and K. Fenton made a series of visits independently. Birds were seen to enter caves to stay, and also to emerge after a short interval. 'Bill-fencing' was noted. Twenty-five birds on July 18th consisted of fifteen adults, seven immature, and three whitish-chinned birds of the year (H.O.B.). Of twenty-

one on August 11th six were juveniles (K.F.). H. Booth saw two enter a recess on April 4th well down a cliff north of Filey Brigg where they remained for two to three minutes. Shags were also seen at Teesmouth on February 17th (K.B.) and at Bempton on May 17th (W. H. Jowsey, J. C. A. Rathmell).

349. Gannet (27).—Three pairs bred at Bempton and three large young were seen on July 25th (H.O.B.). At Spurn *c.* 50 on September 10th was the largest number seen passing south in one day. A young bird was found near Everingham on August 30th (J. W. Lund) and on Blubberhouses Moor on September 6th, and an emaciated bird came down to Otley filter beds early in September (R.A.W.P.).

355. Manx Shearwater (16).—One was found alive in a garden at Headingley, Leeds, on September 1st after gales (C. G. Booth, G.K.Y.) and was released at Fewston Reservoir at dark. At Spurn two moved south on August 13th (J.C.L., M. Ellis) and eight passed north between 4-30 and 6-30 p.m. on September 10th (J.R.G., D.K.N.H.). One was blown inland at Eastfield near Scarborough in the night of September 23rd-24th (A.J.W.). One was seen off Mappleton on July 27th (K.F.) and two birds off Tunstall on July 19th were probably of this species.

360. Great Shearwater (19).—On August 18th G. R. Edwards and his party at Spurn had good views of a large shearwater which wheeled twice during its southward movement showing ' warm brown back and wings in contrast with white body underparts and whitish underwings '.

363. Sooty Shearwater (21).—At sea off Spurn on September 10th, two large Shearwaters flew well out, and two flew near to shore, accompanied by two Fulmars of which the bodies were longer and the wings shorter than those of the Shearwaters. The Shearwaters' colouring was brown-black above, rather lighter below. The lighter underwings (except for dark edges) were more noticeable on the inshore pair than on the two farther out (J.R.G., D.K.N.H.). J. R. Govett's sketches made at the time leave little room for doubt that he named them correctly.

368. Fulmar (26).—Bred on the coast in good numbers and ' appears more numerous than ever at Flamborough ' (K.F., H.O.B.). A few birds appeared on the coast south of the breeding cliffs on dates in March and May, and in August and September. G.H.A. drove one into the Wire Dump trap at Spurn after the heavy floods; it seemed exhausted.

370. Great Crested Grebe (5).—Not less than 50 pairs attempted to breed in 1953; a few were robbed, and others stranded or washed out. Fifty-two young were seen and no doubt there were others. Over 20 waters were concerned. Out of the breeding season the species occurred on the coast as at Whitby on October 3rd (E.A.W., T.W.A.W.), and at Spurn on March 21st and April 4th, and at Eccup in March and October-November (H.W.). A winter-plumaged bird was at Eccup Ing as late as June 6th (A.H.B.L.).

371. Red-necked Grebe (6).—One at Lindley Reservoir on February 15th showed a bill yellow towards the base at ten yards range to J. W. I. Leach. One was seen in the Tees estuary from South Gare on October 11th and 15th (P.J.S., K. and A.B.). One swam close in at Teesmouth on November 22nd (K.B.).

373. Slavonian Grebe (7).—On October 10th and 11th this species occurred at Eccup (D.B.I., H.W., C.N.) and one at Lindley Reservoir on the 25th (C.N.). A medium-sized grebe with straight bill and black cap to eye level was on Castle Howard Lake on December 27th (E.W.T.).

374. Black-necked Grebe (8).—A bird was noted in breeding plumage at Swillington Ing on August 3rd (K.B.). and 19th (K.D.), and two birds of the year on August 23rd (J.C.), and one bird on August 30th (K.D.) and September 6th (J.R.G., C.D.R.). The upturned bill of a bird at Castle Howard was noted on November 22nd (F. Cooke) and there was one, possibly two, at Fewston on November 8th (J.K.F.). One at Stocks Reservoir on December 15th was watched for an hour (A.P).

375. Little Grebe (9).—The species suffered severely from the severity of early 1947 but seems to have recovered completely. At Fairburn *c.* 50 was the estimate on September 19th when one pair still had two small young (J.K.F.) and *c.* 20 were together in one small bay on the 23rd (R.F.D.).

377. White-billed Diver (3).—For details of one found dying at the entrance to Hedon Haven on February 18th by Messrs. Bunting and Stather, see *British Birds*, XLVI, p. 214.

378. Black-throated Diver (1).—An oiled bird was cleaned and released at Whitby on January 2nd by A. B. Walker.

379. Red-throated Diver (4).—After the eastern blizzards of early February, a redthroat at Eccup on the 15th made frantic efforts to take off from ice with Lesser Black-backed Gulls watching (J.R.G., H.W.). One at Coniston Cold on February 20th was found dead on March 10th (R. Tottie per A.P.). On March 1st there were four off Flamborough, and eight off Hornsea, and *c.* 20 off Mappleton (A. Gibbs). 'Divers' were noted passing north at Spurn from March 26th to April 23rd, usually too far out for certain identification but mostly as usual of this species, with *c.* 120 on March 27th and 29th and *c.* 50 on April 14th. The main passage noted at Spurn southerly occurred from October 6th to 11th with maximum of *c.* 20 on the 7th. Recorded on all visits to Hornsea Mere up to April 4th (F.E.C.). One was found alive in a field near Little Weighton on December 12th (D.C.U.).

380. Wood-Pigeon (234).—At Harewood *c.* 2,000 roosted in beeches on January 25th (C.N.) and there were a number of reports of flocks of up to 500 birds from Chevet Woods, Bretton Park, Eccup, Winn Moor, etc. Over Thorngumbald *c.* 750 flew north on December 30th (J.M.L.). Birds were sitting eggs at Methley on March 31st (P.B.) and near Haxby on November 10th (F.J.). At Eccup on October 11th, a dead bird had eleven acorns in its crop, two in its throat, one in mouth and one in stomach (J.R.G.). Odd birds occurred at Spurn in March to May, with six on May 30th-31st and two on October 29th. A nestling ringed near Bingley on June 10th, 1952, was at Wilsden on August 14th, 1953 (J.C.L.).

381. Stock Dove (232).—One ringed, Hebden Bridge, 8/6/52, was near Wakefield, 28/7/52 (*British Birds*). A pair laid eggs on a flattened Ring-Ousel's nest in a hole in a barn wall in the Ingleton Fells area (P.Y.). A pair at Methley with eggs on March 19th deserted when ivy was cut below, but built a new one above and had laid two eggs again by April 9th (P.B.).

383. Turtle-Dove (235).—Rare in the Huddersfield area but a pair had eggs on June 8th (E.C.J.S.). A very few were at Spurn in May—nine on the 30th and odd birds on July 12th and September 13th. A bird at Horbury S.F. on April 30th was the earliest (G.C.).

386. Bar-tailed Godwit (155).—Maxima—Teesmouth, *c.* 220, September 20th, but numbers were larger on the Durham side (P.J.S.); Spurn, *c.* 112 on March 21st and *c.* 100 September 26th-30th; Cherry Cobb sands, *c.* 200 on May 12th (H.O.B., W.A.B.) and *c.* 250 September 10th (J.M.L.). Humber birds were more numerous than for some years. Inland occurrences were: at Eccup, one on August 8th (A.H. B.L.) and two 'probables' over Swillington Park Lake on August 30th (E.G., A.F.).

387. Black-tailed Godwit (154).—Up to five noted on a number of days from August 12th to September 13th in the Cherry Cobb area (J.M.L., W.A.B., H.O.B., K.F.).

388. Curlew (150):

Ringed Gisburn 28/7/51 by J. J. Boon as young, Co. Kerry, 29/9/52.
Ringed Gisburn 7/6/52 by J. J. Boon as young, Limerick, 30/11/52.
Ringed Blubberhouses 19/6/52 by R. M. Band as young, Rathdowney (Leix), 2/9/52.
Ringed Gisburn 26/7/53 by D. B. Iles as young, near Eccleston (Lancs.), August, 1953.

Occurred regularly at Gouthwaite in winter, maximum 74 on December 15th (A.F.G.W.). Seven at Malham Tarn on December 15th and two on the 31st were unusual (P.F.H.). Concentrations about Slaidburn, at Teesmouth, along the Humber, and at Spurn (where some are always present) were not remarkable.

389. Whimbrel (151).—Occurred inland over Ossett on May 19th (J.C.), over Denaby Ings on July 30th (J.S.T.), over Lumley Moor on May 11th when Swifts were passing (A.F.G.W.), over Malham Moor on May 26th and August 13th (P.F.H.), Masham on August 21st, and three at Eccup on August 23rd (H.W.). Passed at Spurn from April 28th to May 9th, and from July 11th to October 18th, with maxima of 20 on August 3rd and September 29th. Seventeen at Stone Creek on May 3rd (W.A.B.) was unusual; otherwise occurrences on several days of odd birds at the Humberside feeding-places in August and September were normal. Several were at Cherry Cobb on May 12th (W.A.B., H.O.B.).

393. Woodcock (148).—A bird was 'roding' at Riffa (Wharfedale) on January 6th (H.M.), and one at Cliffe on February 22nd (E.B.B.). Two birds were flushed from four eggs in nests within six feet of each other on April 2nd at Houghton Moor (L.A.G.). An adult was flushed from half-grown young on April 19th at Farnley, and a juvenile of the same age was found dead there on July 3rd (J.R.G.). Only

recorded at Spurn on November 4th and 6th—a low record, but birds may have come later. ' Never a better year for Snipe and Woodcock in Baldersdale ' (J.R.S.). Twelve were seen during a shoot at Hornsea Mere on November 15th (B.S.).

395. Common Snipe (145).—Over 300 were flushed in Swillington Park on August 18th (J.R.G.).

398. Jack Snipe (147).—Had arrived at Keld Head cress-beds on October 2nd. Odd birds were flushed at a number of places from January to March, and from October to December, on high ground (as Whernside and Cam Fell in October) (P.Y.), and on low ground (as Ossett Spa S.F. (G.C., E.G.) and Denaby Ings) (G.S.T.) on various dates.

400. Grey Phalarope (187).—A bird at Swillington Ing on September 12th had the typical bill and was watched at leisure (G.C., A.G., H.H., D.A.I., Mrs. E. Granger).

402. Turnstone (143).—An adult in breeding plumage at Wintersett on July 22nd and three at Eccup on August 30th (H.W.). Daily at Spurn with maximum of 220 on September 10th.

403. Knot (169).—One was found dead in snow near Sproxton in mid-January (A. Gordon). Large numbers at Spurn in the early months: *c.* 8,000, January 5th and February 15th-18th. Fell away from *c.* 2,000 on April 7th to none on the 30th. Maximum in autumn *c.* 1,500 on October 28th. On November 22nd *c.* 2,000-3,000 on Coatham Sands (P.J.S.). At Fly Flatts Reservoir there was one in grey plumage on June 14th (R.Cy.).

404/5. Dunlin (178).—Maximum at Spurn in spring, *c.* 2,500 on February 16th, and in autumn, *c.* 2,000 on October 8th. Breeding proved on several moors from Baldersdale south to Airedale. The reservoirs, flashes and sewage farms of the West Riding had the usual parties of visitors, with *c.* 30 at Swillington Ing on August 1st (A.G.) as had also the Humber foreshore and coastal resorts.

406. Curlew Sandpiper (179).—All the records come from the Humberside except for one at Hornsea Mere on August 22nd (F.E.C.): at Cherry Cobb Sands, six August 24th (H.O.B.), one September 6th, 7th, 8th and 10th (J.M.L., F.E.K., H.O.B.), and one below Melton on September 6th (D.B.P.).

407. Little Stint (171).—Up to six occurred at Cherry Cobb Sands on five dates from September 6th to 27th (J.M.L., F.E.K., K.F.). There was one at Filey Brigg on August 30th (A.J.W.). One or more occurred north of Kilnsea on September 4th-5th (P.G.R.B., R.F.D., etc.). More frequent inland than usual and usually seen in company with Dunlins, Ringed Plovers, or both: Swillington Park Lake, two on August 30th (E.G.); Knaresborough S.F., one on August 31st (J.R.M.); Denaby Ings, one on September 1st-5th (J.S.T.); Dewsbury S.F., two on August 30th and September 2nd (J.C., H.H.); Fairburn, one on September 5th (J.K.F.) and on September 16th (R.F.D.); and two at Ossett S.F. on September 17th to 20th (G.C., J.S.G.).

409. Temminck's Stint (173).—Of three Stints at Fairburn on September 16th, R. F. Dickens has no doubt that one certainly, and two possibly, were of this species. He saw Temminck's and Little Stint side by side, the former being a greyer, duskier bird and had seen the species in south Sweden fairly recently.

415. Purple Sandpiper (170).—Seen in the usual places—Filey Brigg, Bridlington, Teesmouth, and at Spurn on several dates including one as early as August 5th.

416. Sanderling (181).—Coatham Sands is still a haunt of this species, *c.* 200 were there on August 23rd (C.N.). At Spurn a few occurred in every month up to late July, when daily parties became more numerous with *c.* 100 on July 31st and on September 1st and 22nd. One at Swillington Ing on May 7th (A.H.B.L.), six restless birds at Stocks Reservoir on May 16th, and two in winter plumage at Gouthwaite Reservoir on May 17th with a third assuming breeding plumage (A.F.G.W.), were evidence of cross-country passage. Two at Dewsbury S.F. on September 1st (J.C., H.H.) were the only ones noted inland in autumn.

417. Ruff (184).—Small numbers were noted at the following places in August and September: maxima only are shown—Denaby Ings, six September 1st (J.S.T.); Elland Gravel Pits, one, September 4th (R.Cy.); Cooper Bridge S.F., one, September 10th and 14th (I.G.B.); Dewsbury S.F., six, August 26th-27th (G.C., J.C.); Ossett S.F., three, September 2nd (E.G., G.C.); Fairburn, three, September 5th-9th (J.K.F., R.F.D.); Swillington Ing, twelve, August 30th (E.G.); Cherry Cobb Sands, eight, August 26th (H.O.B.); Hornsea Mere, one, August 23rd (F.E.C.); Spurn, one, August 9th (G.C.).

421. Common Sandpiper (159).—The first was noted on April 8th at Bolton Abbey (J.C.L.). Bred at Swillington Ing where noted from April 12th to September 20th. A flock of 21 fed and flew about together at Dewsbury S.F. on July 13th (E.G.). Heard calling over Doncaster at 11-45 p.m. on July 22nd (J.S.T.) and over Leeds on July 23rd (R.F.D.). The last bird to be noted was at Elland Gravel Pit on October 4th (J.G.B.).

423. Wood Sandpiper (157).—Birds were seen by Swillington Park Lake on August 9th (E.G.), two on the 15th (A.G.), and 16th (A.H.B.L.), when E.G. recorded five, one of which raised its wings revealing pale undersides, and three on the 26th (K.D.). One at Fewston on July 19th (J.K.F). and three at Stone Creek on September 4th (W.A.B.) complete the year's records of which I have seen the observers' notes.

424. Green Sandpiper (156).—A bird that occurred at Copgrove-Staveley area in November 1952 was seen again on January 19th, 1953, and on May 3rd when it had a companion, and one or two were seen on later dates (C.W.). Two were there on October 3rd (A.F.G.W.). Single birds were at Swillington Ing on April 24th (A.H.B.L.) and June 22nd (C.N.) and at Ossett Spa on April 7th (A.F.) and 16th (J.C.). Green Sandpipers were generally distributed in suitable places in autumn, records coming from many observers at more than 20 places, with maxima at Swillington Ing of 11 on August 18th (J.C.) and 12 on August 22nd (Mrs. E. Granger). One at Stavelcy on November 8th (C.W.), one at Newmillerdam on November 22nd (E.G.), and one at Thorngumbald on December 28th (J.M.L.) were the latest.

428/30. Redshank (161).—Numbers at Spurn were up to average with *c.* 100 on March 8th and 9th and with *c.* 100-200 on many days from September to November. *Circa* 400 were about Cherry Cobb Sands from September 10th to 13th (J.M.L.).

431. Spotted Redshank (162).—Occurred north of Kilnsea on April 28th and one called and was seen at Spurn on August 31st (P.G.R.B.). The species was noted in August and September at Cherry Cobb on five days, at Stone Creek on two, and at Hornsea Mere on one.

432. Greenshank (165).—Occurred at Swillington Ing, Denaby Ings, Fairburn, over Penistone, at Ben Rhydding, Coatham Marsh, Hornsea Mere, Stone Creek, Cherry Cobb and Spurn on various dates from July 12th to early October.

435. Ringed Plover (134).—One ringed at Spurn as young 1/8/51 was at Sea Palling (Norfolk) 5/4/53. Fewer young were seen at Spurn than usual, but over 100 adults were recorded on days in March and September. A few seen on many inland waters on various dates.

438. Little Ringed Plover (135).—Seven to nine pairs bred in two areas; eggs and young were seen. Seven young birds were colour-ringed.

440/443. Golden Plover (140).—Of 47+ near Ossett on April 16th all but one had black faces (J.C.) and of *c.* 100 near Ugthorpe (Whitby) on April 6th all the nearest also appeared to be of the Northern race. The largest assemblies reported were *c.* 1,000 at Eccup on April 12th (H.W.), *c.* 500 at Pool-in-Wharfedale on August 29th and *c.* 1,000 there on December 31st (D.B.I.), *c.* 1,000 at Leathley on November 22nd (K.D.), and *c.* 500 by the Calder near Ossett on November 29th (E.G.). These places are usual resorts for large numbers. Smaller flocks occurred at many other places.

444. Grey Plover (139).—A bird appeared at Swillington Ings on April 19th (A.H.B.L.). An adult in summer plumage passed east to west at Eccup on August 4th (K.B.). Up to *c.* 75 were recorded on various days at Spurn from January to early May; *c.* 150 on September 10th was the maximum for autumn. There were *c.* 80 at Cherry Cobb on May 12th (W.A.B., H.O.B.) and *c.* 50 there on September 6th (J.M.L.). At Teesmouth flocks were seen of *c.* 300 on October 11th (A.B., P.J.S.) and *c.* 120 on November 8th (P.J.S.).

446. Dotterel (142).—P. Quin noted 14 birds at 25 yards range on Rombald's Moor on May 9th. The Sedbergh School O. Society per J. M. Sheard reported a Dotterel at *c.* 2,000 feet on the Howgill Fells on June 14th. A forestry worker correctly described two between East Moor and Bilsdale on May 12th (R.M.G.). A Dotterel was shot near Whitby on August 18th (A.B.W.).

449. Lapwing (133).—One ringed as young at Grassington on 25/5/52 was dead near Swinden, between Cracoe and Linton, in early June 1953 (A.T.). A flock at Arnold Carr (E.R.) numbered *c.* 2,000 on January 30th (F.E.K.), and *c.* 3,000 were near East Cowick on February 28th (G.C., E. Ellis). O. C. Hill noted northerly movement in parties along the coast near Saltburn on February 18th; near Marske some turned inland. A slight increase appeared in the breeding birds about Masham.

August 23rd, *c.* 800, at Bottomboat (G.C., A.F.) and August 30th, *c.* 1,000, at Blackmoorfoot Reservoir (E.C.J.S.) were early dates for such numbers. Lapwings increased at Hornsea in late October to early November (M.K.T.). On October 31st movement over Middlesbrough occurred in the morning, and a continuous stream of small flocks passed Teesmouth S.S.W. in the afternoon (P.J.S.). Small movements at Spurn on October 31st and November 1st were followed by *c.* 500 passing south on the 2nd. On November 15th many flocks flew westward in early morning near Fairburn and an hour later many hundreds came from east mostly to settle in fields at Swillington (E.G.). Concentrations numbered *c.* 1,000 at Knaresborough S.F. on November 21st and 22nd (J.R.M.) and *c.* 2,000 in the Leathley fields on the 22nd (K.D.). At Hornsea *c.* 500 came in from the see on November 28th (K.F.). On December 23rd *c.* 2,000 were at Girsby—' an unusual number have been found under wires possibly struck in fog ' (J.P.U.). At Tadcaster a flock numbered *c.* 1,000 on December 28th (J.R.G.).

452. Oystercatcher (131).—' Some foolish person advertised the position of a nest in Wharfedale in the press and people came in cars to view it; the birds forsook.' Bred in the Sedbergh area and in several of the Dales; only attempted breeding at Spurn. A bird ringed near Sedbergh on 21/5/51 was recovered near Berwick-on-Tweed on 10/5/53. High tides having thrown up masses of mussels on Coatham Sands, Oystercatchers there numbered 56 on November 8th and similar numbers were there later in the month (P.J.S.).

462. Black Tern (212).—The spring passage was represented by two males at Wintersett on May 14th (J.C.) and by one at Fairburn on the 16th (J.K.F., A.E.L.). A male at Summer Lodge Tarn on June 21st (K. Baldridge) occurred at a curious time, as did a marsh tern at Semerwater on the same day the plumage of which was so inconsistent that neither J.P.U. nor I could definitely identify the precise species. Two were at Bottomboat on June 28th (E.G.). In autumn there were two at Hornsea Mere on August 11th (F.E.C.), a juvenile at Spurn on the 12th and two birds on August 18th and September 19th, one at Swillington Ing on September 6th (E.G., A.F.), and a bird probably of this species at Gouthwaite on September 20th (A.F.G.W.); and two at Fairburn on September 16th (R.F.D.).

467. Sandwich Tern (223).—Spring passage noted at Spurn was very small. Fifteen passed north at Holmpton on May 9th (H.O.B.). At Spurn in the afternoon of September 3rd, after a strong westerly gale had abated, Sandwich Terns passed southward continuously and became spectacular towards evening. Between 6-5 and 6-35 p.m. *c.* 1,000 passed (R.F.D.); in five minutes, from 6-55 p.m., 206 were counted (F.E.C., D.A.R.), and the day's total was estimated at *c.* 3,000. Ten on September 30th were the last of the year—at Teesmouth last seen on September 27th (P.J.S.). Two large terns at Gouthwaite on September 6th were possibly immature Sandwich Terns (A.G.).

469/470. Common and/or Arctic Terns (217/218).—A ' comic ' tern was at Malham Tarn on April 29th (P.L.) and eight were at Fairburn on April 30th (R.F.D.). Eleven were recorded in June including two Commons at Eccup and six terns at Fly Flatts Reservoir on June 14th (R.Cy.). Single Common Terns were at Nostell Dam on June 2nd (J.C.), near Knaresborough on June 7th (H.J.) and a ' comic ' at Dewsbury S.F. on June 13th (J.C.). In autumn 14 birds on nine dates over six waters included an Arctic Tern at Wintersett on September 3rd to 4th (J.C., E.G.) and four Common Terns at High Royd on September 4th (B.M., I.M.). Not recorded at Spurn in spring; autumnal passage normal. Two birds in Bridlington Harbour on October 23rd were thought to be Common Terns (F.W.).

471. Little Tern (222).—The first at Spurn was seen on April 22nd. About 55 pairs tried to breed, and 101 eggs were found in 50 nests, but only one young bird was seen (for details see A. H. B. Lee and P. H. Saunders in *The Naturalist*, October-December 1953, pp. 150-152). No breeding at Teesmouth was proved (P.J.S.). A Little Tern occurred at Wintersett on May 1st (J.C.).

474. Sabine's Gull (209).—A small gull watched for one minute at the east side of the Spurn Peninsula on September 29th was seen in the air at 50 yards range, and standing on the tide-line. There was a very distinctive amount of black on the primaries. The tail was all white. There was a white ring between the grey of the head and of the back, and the bird appeared to be an adult in winter plumage (J. D. Craggs).

477. Little Gull (207).—A Little Gull at Wintersett Reservoir on May 3rd showed the dark wing-bar of immaturity (J.C.).

478. Black-headed Gull (208):

Ringed Heptonstall Moor 8/6/52, Saxilby (Lincs.), 28/7/52 (*British Birds*).
Ringed Heptonstall Moor 15/6/52, Bridgend (Glam.), 30/7/52 (*British Birds*).
Ringed Heptonstall Moor 22/6/52, Valencia, Spain, 15/2/53 (*British Birds*).
Ringed Haworth Moor 3/7/52, near Navan, Meath, 10/10/52 (*British Birds*).
Ringed Haworth Moor 8/6/49, Keighley, 6/11/53 (C.D.R.).
Ringed Swillington Ing 11/7/49, near Wolverhampton, February 1953 (D.B.I.).
Ringed Swillington Ing 11/7/51, Merionethshire, 16/6/53 (D.B.I.).
Ringed Swillington Ing 8/7/50, found dead, Swillington Ing, 8/7/53 (D.B.I.).
Ringed Swillington Ing 11/7/51, Stourton, near Leeds, 28/7/53 (D.B.I.).

A bird picked up near Scarborough had come from near Oslo (A.J.W.). The species continues to colonise suitable places on the moors, but is robbed except where inaccessible, and young at some places appear to be killed deliberately. There are a few colonies in the lowlands. Roosts were large at Hornsea Mere, and very large at Eccup in the late autumn probably mainly of immigrants. At Stocks Reservoir there were *c.* 1,750 on November 28th (J.K.F.).

481. Common Gull (201).—One at Spurn Point found by J. C. Leedal on October 18th, 1953, bore a Stockholm ring. Passage and winter distribution were normal but birds at Eccup, one on July 27th (C.N.) and at High Royd, one on July 19th, were early. P. F. Holmes noted ' trampling ' by this species near Malham Tarn which seemed to be effective.

484/5. Lesser Black-backed Gull (199).—A pair had three eggs at Kettleness on June 9th and a second pair probably (P.J.S.). Large numbers of eggs were collected at the Roeburndale colony which may be less fruitful in future as a place for ringing young. Roeburndale ringings not previously recorded here:

Ringed 2/6/49 by A. F. Airey, recovered 25/9/50, Dunkirk, France.
Ringed 1/7/49 by A. F. Airey, recovered 25/11/50, Vigo, Spain.
Ringed 22/6/49 by A. F. Airey, recovered 15/5/51, Poamarch, Finisterre, Spain.
Ringed 29/6/52 by Davis and Iles, recovered W. Morocco, 24/2/53.
Ringed 8/7/51 by Watts and McConville, recovered W. Morocco, 29/1/53.
Ringed 27/7/50 by Davis and Iles, recovered Coast of Mauretania, W. Africa, 25/2/53.
Ringed 7/7/50 by Davis and Iles, recovered Oporto, Portugal, 1/1/53.
Ringed 27/7/50 by Davis and Iles, recovered Ardsley, Leeds, 5/8/53.

Odd adults of the British form were at Gouthwaite in January (A.F.G.W.) and five at Arsdley Reservoir on February 7th (J.C.). Birds of the Scandinavian form occurred at a number of times and places in autumn and winter.

486. Great Black-backed Gull (198).—A. Pilkington informs me that one or two of this species nest about the large colony of *fuscus* on and over the western county boundary. Noted inland at various places in winter, maxima 32 at Ardsley on February 7th (hard weather) (J.C.), and 22 at Wintersett on December 19th (J.C.). Largest number recorded at Spurn *c.* 480 on August 28th (J.C.L.).

487. Glaucous Gull (202).—One, sometimes two, noted almost daily from March 28th to May 9th at Spurn, also noted on September 10th and October 10th. One occurred near North Ferriby on January 17th (D.B.P.). A juvenile Glaucous, or Iceland, Gull was about Filey Brigg on December 28th (A.J.W.).

489. Kittiwake (211).—A juvenile was at Wintersett Reservoir on August 14th and for several days (J.C.). Noted at Spurn on March 21st and 22nd, and four on September 19th but unobserved occurrences were probably more frequent. A dead bird at Hornsea Mere on April 19th had three eggs in its oviduct (M.K.T., A.H.).

491. Great Skua (194).—A dark Skua that pursued Sandwich Terns at Spurn on September 1st appeared ' just short of Great Black-backed Gull ' in size and had silvery patches on undersides of wings (P.G.R.B.). One was at Atwick on August 8th (H.O.B., L.S.).

492. Pomarine Skua (195).—A large Skua near the North Gare, Teesmouth, on September 12th, chased a Sandwich Tern, alighted near a Great Black-backed Gull, and flew southward past the South Gare. It resembled exactly the specimen of this species in the Nelson collection at the Middlesbrough Museum and was thought to be a juvenile (P.J.S.).

In *Yorkshire Birds*, p. 301, a bird in the Keighley Museum killed on September 17th, 1942, appears under the heading of Arctic Skua as it was first reported to me.

Later it became labelled as a Great Skua. Doubts about the specimen having been expressed by C. D. Robinson, and the curator, Mr. J. Ogden, I inspected it on October 2nd, 1953, and found it to be a typical, dark form, Pomarine Skua, except that the central tail-feathers were not completely grown nor twisted; probably it is a juvenile. Mr. Alfred Hazelwood agrees the bird is a Pomarine Skua. This is the only case of misidentification in *Yorkshire Birds* that has come to light and should be corrected.

493. Arctic Skua (193).—Birds were noticed at Spurn on many days in August and September, dark form birds predominated. On August 18th, there were ten. Records also come from Tunstall: one on July 19th (W.A.B.) and in August from Whitby, Staithes, Flamborough, Filey Brigg and Dimlington, and a pale bird from Stone Creek on September 8th which forced a Black-headed Gull to disgorge (W.A.B., H.O.B.).

494. Long-tailed Skua (196).—While fishing 1½ miles off Redcar in early August, G. Mountain saw a Skua pass twenty yards away with slender tail-feathers projecting beyond the tail by six to eight inches (P.J.S.). A Long-tailed Skua at Spurn on August 20th (G.R.E.) and August 25th (J.C.L.) had an injured left leg.

498/9. Guillemot (227).—Young birds on the ledges at Bempton were very few compared with the number of adults present during the nesting season. More ' climming ' had been done than was expected, and it is impossible for anyone even to go down the cliffs without consequent damage to the Guillemots' eggs, even if none are taken.

503. Puffin (230).—Rather curiously, on May 9th, off Flamborough Head, there were more Puffins to be seen than either Guillemot or Razorbill (H.F.W.).

504. Corncrake (125).—One was found dead near Beverley on May 14th by Mr. Simpson of Leven (F.E.C.). Five pairs were located within two miles of Sedbergh (E. I. Cuthbertson per C.M.). Calling was heard in twelve other areas. Occurred at High Royd on August 7th and 12th (B.M.) and one was caught and released at Denton on October 5th (F.B.), the only one reported for the area.

505. Spotted Crake (121).—A pair was seen at close quarters in South Yorkshire on April 27th.

509. Water Rail (120).—Reported unusually frequently for this skulking species. Bred at Skipwith and east of Doncaster and noted in the breeding season at Fairburn (R.F.D.), and during much of the year near Knaresborough (C.W.), and near Chevet (four on December 6th) (E.G., A.F., J.C.). There was one at Sewerby on April 3rd (F.W.). One walked across a road near Swillington Ing on September 20th (G.C., J.S.G.). Other occurrences were at Esholt S.W. in February (J.B.N., at Whitby on November 28th where a cat killed one, and a dead one at Ruswarp on November 29th (A.B.W.), one on the edge of the marsh near Ramsgill on December 6th (A.F.G.W.), one High Royd on December 19th (R.Cy.), one at Farnley Lake on December 7th (P.B.), one near Doncaster on December 24th (J.S.T.), and one at Altofts on December 27th (E.G.). A Water-rail came aboard a ship off Portugal on October 10th and was released after being fed by the Hull Branch of the R.S.P.C.A. (G.H.A.).

511. Coot (127).—Numbers in autumn were well down on last year at Hornsea Mere (F.E.C., M.K.T.); at inland waters numbers were average. Fairburn (not counted last year) showed *c.* 100 on September 5th and *c.* 300 to 400 by November 14th (R.F.D., J.K.F.). K.G.S. and A.P. both remarked they had not seen Coots at Stocks Reservoir before (six on August 30th, nine on September 22nd); it will be interesting to see if this reservoir builds up as a winter resort.

513. Black Grouse (113).—Nested as usual about Stocks Reservoir (A.P.), on the Ingleton Fells (P.Y.), and also in Baldersdale but there the wet spring and tapeworm combined to produce a poor season (J.R.S.). Twelve cocks at the foot of Ling Ghyll on November 29th was interesting. A bird was on Sleights Moor on October 28th (T.W.A.W.). Odd birds were noted on a number of the western fells.

520. Quail (117).—A nest was cut over at Fadmoor on July 4th (R.W.C.), After being heard at Thornton Dale from June 24th, a bevy of six was flushed by shooters on September 16th (R.M.G.). Near Driffield a bird was heard on July 3rd (R. Whitlock in *The Field*) and a bevy of eight seen on September 17th (F.W.). Quails were also heard near Rowley on June 10th and 11th (D.C.U.), near Ebberston on June 14th and 21st (P.J.S.), in Goole fields on June 19th (W.B.), near Penistone on June 20th to August 8th (J.C.S.E.), and near Alwoodley on August 7th to 14th (R.V.J.).

In Memoriam

HARRY BRITTEN, M.SC., F.L.S., F.R.E.S.

With the passing of Harry Britten, British Entomology has lost its greatest figure. The gap in its ranks which he leaves will never be filled for he was unique both as an entomologist and as a personality. He died in his 84th year on January 31st, after a short illness, at his home in Stockport.

Harry Britten was born at Whiteparish in Wiltshire on September 3rd, 1870, and much of his youth was spent in Cumberland where he found employment in several estates eventually becoming a Head Keeper, after a brief spell of work on the railway. He was a man of fine physique and great strength and excelled in all country activities. In his early years he took a keen interest in Lepidoptera but later studied the Coleoptera and Hemiptera. He soon made a name for himself as a coleopterist because of his great skill in the field, the superb preparation of his specimens, and his keen species-sense. Indeed he has never been excelled in the field where his wide knowledge of botany and his incomparably co-ordinated hands and eyes enabled him to discover things hidden from the ordinary field naturalist.

Britten had the broadest interests in entomology and was also a good acarologist. For some years he specialised in the family Ptiliidae which includes the smallest known beetles. The full magnitude of his work can only perhaps be fully appreciated by his close friends but fortunately he had many of these for he was the kind of man who attracted friendship. He was a simple, good humoured and friendly man with a peculiar quality of personal charm which endeared him to all and gained him the respect and veneration of the many naturalists with whom he came in contact. He was generous to liberality and his best discoveries were given freely to his many specialist friends to assist their work. Many expressions of gratitude and indebtedness in the entomological literature of the last half century testify to Britten's wonderful critical ability and fine field work, and nearly a score of British species have been named after him.

He was far happier in collecting, mounting and studying insects than in writing about them so that he wrote only a small number of papers, much to our loss. In 1913 the opportunity to turn professional occurred when he joined the staff of the Hope Department at Oxford and he did excellent work there until he moved to Manchester in 1918 to take up a commercial appointment. He soon attracted the notice of the late Mr. T. A. Coward and joined the staff of the Manchester Museum in 1919. Thus began the long association which extended beyond his retirement in 1937 to his very last days. It is true to say that Britten made the Department of Entomology at the Museum and his magnificent work was royally finished when he passed over his fine personal collection in 1951.

No one has ever displayed a greater technical skill in all branches of Natural History and his mounting, dissection, and general preparation of insects was of the highest order. During his period at the Manchester Museum Britten was keenly interested in the fauna of Lancashire and Cheshire and his very full record cards are now in the Museum. His annual reports of additions to the fauna appeared for many years, until 1951, in the publications of the Lancashire and Cheshire Fauna Committee. Other papers on systematics and faunistics were published in the *Entomologists' Monthly Magazine*, *Lancashire Naturalist*, *Lancashire and Cheshire Naturalist*, and the *North Western Naturalist*.

In a short notice it is not possible to do full justice to such a remarkable man as Harry Britten whose great talents and personal qualities made him so universally admired and revered. He was always the hub and centre of keen entomologists, young and old, and the loss of his sage leadership will be felt throughout the country and particularly in the north.

To Mrs. Britten and her five children, all of whom survive him, we wish to express our sincere sympathy. W. D. H.

ADDITION TO THE ANNUAL REPORT

Lepidoptera: Mr. D. Wade, of Hull, describes a partial migration of the White Butterfly, *P. brassicae*, at Spurn on August 27th, 1953. The movement was across the peninsula in ones and twos from the eastern or sea side down towards Kilnsea, where, half a mile away in the village, there were many hundreds gathered in a clover field.

A further record is of an Oleander Hawk Moth, *D. nerii*, at Wilsthorpe, Bridlington, on October 27th, 1953, and now preserved in the Hull Museum collections.

E. Dearing.

THE ENTOMOLOGY OF SPURN PENINSULA

(*Continued from* 1953, *page* 172)

OTHER INVERTEBRATES AND VERTEBRATES (*continued*)

MOLLUSCA (*continued*)

LAMELLIBRANCHIATA

Macoma balthica L. Extremely abundant on the mud-flats of the Humber shore; 31 specimens were counted in a single spadeful of mud. [Common on mud-flats, Welwick, 52.] The pink shells are abundant on the beach on the Humberside. During the flooding specimens were washed into Walker Butts Bank Dyke, the land-mine crater and the pond in Marsh Meadow; some were still alive in the last situation in water with only 20% of the salinity of sea-water.

[*Mya arenaria* L., a few far out on mud-flats, Welwick, 52.]

Cardium edule L., small numbers found living on the mud-flats, 52; [also Welwick, 52]; shells moderately common on the beach, Humber side.

Mytilus edulis L., a few living attached to a breakwater and lumps of chalk on the Humber shore near Marsh Meadow, 52; there is a mussel-bed in the Humber off the salt-marsh and shells are common on the beach.

GASTEROPODA

Littorina saxatilis Olivi., common near the edge of the shelving part of the beach on the Humber side; [in similar situation at Skeffling, 49]; feeding on *Zostera* in shallow pools on the mud-flats, 52.

L. littorea (L.), in smaller numbers in the same situations as *L. saxatilis;* common in association with *Fucus vesiculosus* on chalk boulders on the shore near the salt marsh, 50.

[*Assiminea grayana* Leach, moderate numbers Welwick salt-marsh, 52.]

Sabanaea ulvae)Penn.), extremely abundant on the Humber shore, extending far out on the mud-flats, and reaching inshore to the lower part of the shelving beach; it swarms in clumps of *Spartina*, and also feeds on *Zostera*. Abundant in a pool at the top of the shore near Walter Butts Bank, 53. [On Welwick salt-marsh it abounds on the wet mud beyond the *Spartina*, and extends inwards to the landward edge of the marsh, where it occurs on mud among *Triglochin*, *Obione portulacoides* and *Festuca rubra*.] It was carried by the flood of 53 into Walter Butts Bank Dyke and the pond in Marsh Meadow; [also found in 53 in a salting near the eastern end of Long Bank Dyke.] Dead shells found occasionally on the dunes.

Hydrobia ventrosa Mont., common on *Ruppia*, Walter Butts Bank Dyke, 49, 50, 52, 53; [Saltings near Long Bank Dyke, 52, 53.]

H. jenkinsi Smith, common in Boundary Dyke, 50, 52, 53; land-mine crater, Marsh Meadow, 53; [Long Bank Dyke, 53; a salting near Long Bank Dyke, 53.]

Phytia myosotis (Drap.), common on the salt-marsh down the peninsula, among *Obione portulacoides*, 50; [in a similar situation at Welwick, 49, 52.]

Limnaea pereger (Müller), common on *Ranunculus baudotii*, pond in Marsh Meadow, 49, 50, 52; land-mine crater, Marsh Meadow, 52; [Long Bank Dyke, 52]; some were introduced into the water-butt at Warren Cottage, and this was the only place where the species could be found in 53. All specimens were of the dwarf form.

L. truncatula (Müller), *Phragmites* area, 50, apparently exterminated 53.

The terrestrial molluscs differ in their distribution mainly in relation to the moistness of the environment. Six species were found only in the Warren area, one extended to the shade of *Hippophae* on the Main Ridge, and six were found on the marram dunes.

Cochlicopa lubrica (Müller), among grass on clay areas of Warren, 50, 52; under *Hippophae* on main ridge near Warren, 52.

Arion ater (L.), few near Cottage and in *Phragmites* area.

[*A. hortensis* Fer., near Long Bank Dyke, 52.]

Helicella virgata (da Costa), under boards near Cottage; common on the dunes to the end of the peninsula, in some places abundant; [common on the coast, Welwick, 49.]

H. caperata (Mont.), in similar situations to *H. virgata*, common; under *Hippophae*, 52. The var. *ornata* is common.
[*Theba cantiana* (Mont,), near Welwick salt-marsh, 49.]
Trichia hispida (L.), under boards near Cottage, 49, 50, 52; *Phragmites* area, 49.
Ashfordia granulata (Alder), under boards near Cottage, 49, 50; *Phragmites* area, 49.
Cepea nemoralis (L.), common on Warren and dunes to the end of the peninsula; [Welwick, 49.]
Helix aspersa Müller, near Cottage; end of peninsula near buildings; at site of former hut on dunes; also here and there on the dunes far from habitations.
Retinella nitidula (Drap.), near Cottage, under boards, etc.
Oxychilus cellarius (Müller), under boards near Cottage; [near Long Bank Dyke, 52.]
O. alliarius (Müller), damp parts of Warren, 50; old dunes, 52; common under concrete slabs on dunes on site of former hut, 52.
Vitrina pellucida (Müller), damp parts of Warren, 49, 50; among *Agropyron junceum* on dunes, 50; old marram dunes, 52.
Agriolimax laevis (Müller), common near Cottage and in Warren generally.
A. agrestis (L.), few in Warren, 52, 53.

CRUSTACEA MALACOSTRACA

As in the case of the Mollusca, the variety of Crustacea reflects the variety of habitats present in the area studied. I am greatly indebted to Mr. J. G. Blower and Dr. E. J. Iles for assistance with identifications.

MYSIDACEA

Neomysis intiger (Leach), not found till 53, when it occurred in the pond in Marsh Meadow, a new ditch dug parallel to Walker Butts Bank Dyke [and in Long Bank Dyke]. Possibly carried in by the flood.

AMPHIPODA

Gammarus locusta (L.), abundant on the mud-flats among *Zostera* and in *Spartina* clumps; [in similar situations at Welwick].
G. zaddachi Sexton, up to 1952 common in Walker Butts Bank Dyke and the lower end of Boundary Dyke; after the flood of 53 more widespread (pond near Boundary Dyke, pond in Marsh Meadow, bomb crater in *Phragmites* area, a tank near the Cottage, and in some new pools near Walker Butts Bank Dyke formed when clay was excavated for repairing the bank). [Long Bank Dyke, 52, 53; in saltings near Long Bank Dyke, 53.] Most of the specimens are referable to *G. z. zaddachi*, but some of those found in 53 appear to belong to *G. z. salinus*.
G. duebeni Lillj., up to 52, found in pond in Marsh Meadow, land-mine crater in Marsh Meadow, Walker Butts Bank Dyke, Boundary Dyke, and Pond near Boundary Dyke. In 53 also found in two new habitats near Walker Butts Bank, and in a tank near the Cottage.
Melita palmata (Mont.), Humber shore, among lumps of chalk, 52.
Corophium volutator (Pall.), on mud-flats [common in mud of Welwick salt-marsh]. common in Walker Butts Bank Dyke [and in saltings near Long Bank Dyke.] Distribution apparently unaffected by flooding.
Orchestia gammarella (Pall.), on Humber shore near the bottom of the shelving beach; [Welwick salt-marsh near the shore]; common near Walker Butts Bank Dyke [and saltings near Long Bank Dyke], where it occurs in cracks of the clay when the dykes dry out; common in a similar situation in the salt-marsh down the peninsula. Apparently less common in 53.
Talorchestia deshayesei (Audouin), Humber shore with the last species, also common in weed at high-tide mark; [saline pool near eastern end of Long Bank Dyke, 52.]
Talitrus saltator (du Croisac), Humber shore, not so common as preceding species; [edge of saline pool near eastern end of Long Bank Dyke, 52; Welwick salt-marsh, 50.]

ISOPODA

Eurydice pulchra Leach, swimming in shallow water near a groyne on the North Sea shore, 50.
Jaera marina (L.), Humber shore, in pools among lumps of chalk at the edge of the mud, 52.

Idothea viridis (Slabher), common among weed of mud-flats of Humber shore; [in a similar situation at Welwick; common in a saline pool near eastern end of Long Bank Dyke, 52; common in a salting near Long Bank Dyke, 53]; few in Walker Butts Bank Dyke, 53.

Sphaeroma rugicauda Leach, common on the Humber shore near the top of the mud; fairly common in the salt-marsh, 50, when found in cracks of the dried mud; fairly common in Walker Butts Bank Dyke [and in saltings near Long Bank Dyke]; few in Boundary Dyke; [appeared in Long Bank Dyke, 53].

Ligia oceanica (L.), in small numbers on groynes, under driftwood and in cracks of clay cliffs, both on North Sea and Humber shores; [on stony beach, Skeffling, 49.]

Trichoniscus pusillus Brandt., common in damp clay soil of the *Phragmites* area, where it was still present in 53 after the flooding.

Philoscia muscorum (Scop.), common on the ground among the roots of plants in the Warren, *Phragmites* area and Marsh Meadow, extending down the peninsula in places where there is a complete carpet of vegetation; common under *Hippophae*. Present in 53 in areas that had been flooded.

Platyarthrus hoffmannseggi Brandt, in nests of *Formica fusca*, near Cottage, 52 and under old railway sleepers in Warren, 53.

Oniscus asellus L., small numbers in *Phragmites* area and under boards near Cottage; present, though scarce, in 53.

Porcellio scaber Latr., abundant under stones and boards in Warren, and under driftwood and storm debris, in dead marram tufts and other dry places right down the peninsula. Reddish or sand-coloured specimens common. Large numbers visited sugar at night near the Cottage, intended for moths.

Armadillidium vulgare Latr., common and widespread, occurring with the last species; also common in the clay of the salt-marsh and present in the *Phragmites* area.

A. pictum Brandt., associated with *A. vulgare* in the older dunes, and under debris at the top of the Humber shore.

DECAPODA

Paleomonetes varians Leach, up to 1952 common in Walker Butts Bank Dyke, especially near the northern end where the water is more permanent, and in the adjacent part of Boundary Dyke; [in Long Bank Dyke confined to the North Sea end; also found in a saline pond near the North Sea and of Long Bank Dyke.] Distribution similar in 53 [except that it was now common throughout Long Bank Dyke, and the saline pond had been filled up with sand.]

Carcinus maenas (L.), common on the mud-flats at Spurn and Welwick, mainly small specimens; *Megalopa* larvae occurred among *Spartina* clumps; adults in Walker Butts Bank Dyke, surviving under boards, etc., when the dyke dries up.

MYRIAPODA

Mr. J. G. Blower has very kindly identified specimens of Myriapods collected by the author, as follows:

DIPLOPODA

Cylindroiulus latestriatus (Curtis) (=*C. oweni* Bollman), widespread and very common in the marram dunes, under *Hippophae*, in the *Phragmites* area, under storm debris among vegetation along the Humber shore, and in cracks in clay cliffs on the North Sea shore.

Tachypodoiulus niger (Leach), Marsh Meadow and near Cottage, frequent; [near Long Bank Dyke, 52].

Blaniulus guttulatus (Bosc.), under trees near cottage, 51.

Brachyiulus pusillus (Leach), damp clay soil, *Phragmites* area, common, 52; none found here, 53.

Brachydesmus superus Latzel, *Phragmites* area, 49, 52, but not 53; [near Long Bank Dyke, 52.]

CHILOPODA

Lithobius forficatus (L.), common near Cottage; few in *Phragmites* area; few under *Hippophae;* several under concrete blocks in site of former hut in marram area, 52; common under storm debris near Marsh Meadow and down the peninsula; [Welwick, 49.]

L. melanops Newport, Warren and Marsh Meadow, 50, 51; in site of former hut in marram area, 52; under timber washed up among *Carex arenaria* on dunes, 53.
L. duboscqui Brol., under trees near Cottage, 51.
L. crassipes Koch, near Cottage under stones, 52, 53; under storm debris near Marsh Meadow, 52.
Haplophilus subterraneus (Shaw), in soil formerly cultivated near Cottage, 51, 53; under trees near cottage, 51.
Necrophloeophagus longicornis (Leach), under stones near Cottage, 50, 52.
Scolioplanes maritimus (Leach), chalk wall near salt-marsh, 52.
Brachygeophilus truncorum (Bergsö and Meinert), under *Hippophae*, 52.

VERTEBRATES, other than BIRDS

FISH

Gasterosteus aculeatus Linn., Three-spined Stickleback, Walter Butts Bank Dyke, 49-53, common; Boundary Dyke, 49-53, few; pond in Marsh Meadow and pond near Boundary Dyke, 52, 53, few; in 53 it had invaded a number of new pools formed by the excavation of clay used in repairing Walter Butts Bank, and also in 53 it was found for the first time in the land-mine crater in Marsh Meadow; [Long Bank Dyke, 52, 53; saltings near the eastern end of Long Bank Dyke, 52, 53].
[*G. pungitius* Linn., Ten-spined Stickleback; two specimens in a salting near Long Bank Dyke, 53.]
Anguilla vulgaris Tarton, Eel, young specimens in Boundary Dyke, 52, 53, few.
Pleuronectes flesus Linn., Flounder, fairly common on mud-flats of Humber shore, 51, 52; one at the northern end of Walter Butts Bank Dyke, all young specimens.

AMPHIBIA

Triturus cristatus (Laurenti), Great Crested Newt, larvae in small pool, *Phragmites* area, 50; several larvae in land-mine crater, Marsh Meadow, 52; none in 53.
Bufo bufo (Linn), Toad, larvae in pond in Marsh Meadow, 50; adult in Marsh Meadow, 52; none found 53.

REPTILES

Lacerta vivipara Jacquin, Common Lizard, near Cottage, 49, 52, 53; *Phragmites* area, 52; Marsh Meadow, 53; [Welwick salt-marsh, 49; Long Bank Dyke, 49.]
Natrix natrix (Linn.), Grass Snake, near Cottage, 48, a large specimen measuring 3 ft. 7 ins. in length; *Phragmites* area, 52; Marsh Meadow, 52. I was informed that many snakes were drowned in the floods of January, 1953.

MAMMALS

Systematic trappings for small mammals was carried out in July, 52; otherwise the mammal list is based on casual observations.
Erinaceus europaeus Linn., Hedgehog, single specimen killed by a car about half-way down the peninsula, 52.
Sorex areneus Linn., Common Shrew, immature specimen near Cottage, 49; by far the commonest species trapped in 52, occurring in Warren, Marsh Meadow, marram dunes down the peninsula, [Kilnsea saltings (where nest containing young found)].
Neomys fodiens Schreber, Water Shrew, Boundary Dyke, 52, few; signs of presence here, 53.
Oryctolagus cuniculus (Linn.), Rabbit, common on Warren and near salt marsh, all visits.
Cleithronomys glareolus Schreber, Bank Vole, Warren near *Phragmites* area, 52; Marsh Meadow, 52; nest with young by roadside near Marsh Meadow, 52.
[*Arvicola amphibius* (Linn.), Water Vole, Long Bank Dyke, 53.]
Apodemus sylvaticus (Linn.), Long-tailed Field-mouse, several nests near Cottage, some with young, 49; Warren, 52; [nest on Welwick salt-marsh, 49].
Mus musculus Linn., House Mouse, few in Cottage, 49.
Rattus norvegicus (Erxleben), Rat, said to occur near Cottage, 49, 50, but none seen; [one seen Kilnsea, 52].
Vulpes vulpes (Linn.), Fox, a den with cubs, south end of Warren, 47; several shot by local people in 52, including a female and young in the Warren, and others near the salt-marsh; foxes said to be still living in the area, 53.

Mustela erminea Linn., Stoat, jaw found in rabbit warren near salt-marsh, 53; probably seen in the Warren, 52, but not definitely identified.

Phocaena phocaena (Linn.), Porpoise, skull found in a creek in salt-marsh, 50; in 47 several small cetaceans were washed ashore on the North Sea side of the peninsula, near the Point, and another in 50, but these were not definitely identified.

(*To be continued*)

NOTICES

Natural History Course, Wrea Head College, Scarborough.

For those interested in the subjects which constitute Natural History a Course is being held from July 2nd—7th, in conjunction with the Further Education Department of the North Riding County Council, at Wrea Head College, Scalby, near Scarborough. The fee for the course, including food and residence is £3 15*s.* 0*d.* For those resident *within* the North Riding the fee is £1 17*s.* 6*d.*; for these there is also a return of third class railway fare in excess of 5/-.

Application for admission to the Course should be made to: The Secretary for Education, County Hall, Northallerton, Yorks.

Errata. The address of Mr. E. Dearing is 37 Omerod Road, Burnley, and not Omerod Street as given in the January issue.

FIELD NOTE

American Yellow Billed Cuckoo at Cloughton.—On the 14th, 15th, 16th and 17th November, 1953, an American yellow billed cuckoo—*Coccyzus americanus americanus* (L.)—frequented the garden of Mr. Ramskir's house at Cloughton. It was first seen by Mrs. Ramskir, and later at very close quarters in good light by Messrs. E. H. Ramskir, R. S. Pollard, E. A. Wallis and R. M. Garnett. So far as we can discover it is the first record for Yorkshire.

It is about ten to eleven inches long from the bill to the tip of the tail. The most prominent features are the curved bill and the long tail, which is nearly as long as the body. The colouring is as follows: Bill: yellow with a black tip and a black line along the upper mandible. Head: dark grey. Eye: pale yellow circle around it. Back: dark grey with a slightly brownish tinge. Wings: warm rufous primaries with dark tips. Under parts: grey on the breast becoming lighter towards the hinder parts. Tail: long and slender, darkish in colour with white or whitish spots along the outer edge, but these were not very conspicuous. Legs: dark bluish grey, and the feet could be seen to be zygodactyl.

The bird was seen to fly up to the wall of the house and take the pupae of insects, believed to be cabbage white butterflies. It was seen to catch and swallow these several times. In flight it flew with rapidly beating wings, direct and, so far as could be seen, without dipping, and the rufous wing feathers were conspicuous in flight. It was reasonably tame but did not appear to be in very good condition, and the feathers of the tail in particular were draggled.

Careful notes and sketches were made on the spot by those who saw the bird. Photographic records taken on the 17th November have proved to be successful. E. H. Ramskir, R. S. Pollard, E. A. Wallis.

By kindness of Mr. Garnett and Mrs. Ramskir, I was able to see this bird myself on November 16th. I watched it take several cabbage white pupae, once from the frame of the window through which I looked less than a yard away. The tail feathers were abraded but parts of the white spots could be seen. As the bird left a wall, it dipped, flattened out, and flew direct near to the ground. It is indeed an addition to the Yorkshire list. The new Check-List of the B.O.U. gives the number of British occurrences as 16. I am informed that this bird is the third recorded for the autumn of 1953, one of them in Shetland. This species is not parasitic. It breeds in temperate North America as far north as southern Canada, and migrates south for the winter.—R. C.

BOOK REVIEWS

Leopard of the Hills, by **James Temple.** Pp. 190. Bell. 12/6.

Is this story too long to describe the life of one leopard in the hill country of North India ? Not so, for after reading the book one feels that a lot more could have

been written. Apart from the last two months of his life Chitwa was an ordinary leopard but Mr. Temple makes his life story enthralling reading and leaves no doubt about the amount of cunning and reasoning which must be constantly operative to enable an animal to survive when living near human habitation, be that but a jungle-edge tea plantation.

Mr. Temple's description is evidently the outcome of years of careful study of the lives and habits of leopards. There are excellent word pictures of the terrain in which Chitwa spent his life and also of the weather conditions to which such country is subject. Good reading. J.P.U.

The Composition and Origin of the Antrim Laterites and Bauxites, by **V. A. Eyles.** *Mem. Geol. Survey.* Pp. 85. H.M. Stationery Office, Belfast, 1952. 12/6.

This report, the first to appear since the establishment in N. Ireland of a district unit of the Geological Survey, deals mainly with the chemistry and mineralogy of the rocks in question and especially of the process of lateritisation which appears everywhere to follow the formation of kaolin minerals. Reference is made to specific areas but the detailed account of the geology of the district will appear later. H.C.V.

The Lapwing in Britain, by **K. G. Spencer.** A. Brown & Sons, Ltd., 1953. 16s.

This unpretentious volume is a valuable addition to the literature of British ornithology, dealing with every aspect of the life history of one of the most interesting and beautiful of our birds and including chapters on its local names and its place in folklore and poetry. The plates from photographs by a number of bird photographers, are well selected to illustrate different plumages and aspects of behaviour of the Lapwing.

The book is based on the writer's study of the bird over a period of seven years in the Burnley District of Lancashire, but he has also made a thorough search of the literature, not restricted to British publications as his title might imply, but embracing important studies of the species made in Holland, Germany and elsewhere.

The author comes to the conclusion that in England and Southern Scotland the Lapwing has steadily decreased during the last hundred years, but there seems no doubt that it has increased in Northern Scotland and especially in Orkney and Shetland. He considers that the decrease in England is due to the increased area of arable land, to which the birds are attracted for nesting, but on which they rarely succeed in rearing young owing to the destruction of their eggs or chicks in agricultural operations. Incidentally, he refers to an enquiry by the (then) Board of Agriculture soon after the first world war which indicated that there had been a widespread decrease and says that he has been unable to examine the report on this enquiry. It may therefore be worth while to put on record that the returns sent in to the Board were deposited by the late Sir John Fryer in the Edward Grey Institute at Oxford. One of the difficulties in reaching conclusions as to changes in the status of the Lapwing in any area is that its status in the breeding season may be very different from its status in winter, yet few of those who mentioned it as abundant or uncommon in particular districts in the past said to which season they were referring. The great increase in sewage farms, reservoirs and gravel pits in England during the past century has undoubtedly provided the Lapwing with additional habitats suited to its needs in many inland areas.

Perhaps the most important addition that the author has made to our knowledge of the species is in relation to its roosting and flocking habits. He finds that outside the breeding season birds from a considerable area assemble in the evening and, after a period of feeding, remain to roost together if the night is dark. But for some nights on either side of full moon they continue to feed during the night and then remain on their assembly ground during the following day, bathing, preening and sleeping. His observations are fully borne out by counts made by A. W. Boyd of the numbers of Lapwings present in the daytime on Witton Flashes in Cheshire, during the winters of four successive years. These figures are given in an appendix and show that it is invariably about the period of full moon that very large numbers, sometimes reaching 10,000, are present in this locality. It may be hoped that these observations will stimulate bird-watchers to record what the birds do in other regions, especially where the chief feeding grounds are on coastal marshes where the tides must introduce another variable factor. W. B. A.

A Field Guide to the Birds of Britain and Europe, by **Roger Peterson, Guy Mountfort and P. A. D. Hollom.** Pp. 352; 1,200 illustrations, 650 in colour; 380 distribution maps. Collins, London, 25/-.

Since the war more and more people have been visiting the Continent, and the British ornithologist is likewise extending his interests to foreign fields, where only can he see with reasonable assurance many of the species on the British list, and in general enlarge his experience. To assist him abroad, there has up to now existed no suitable, single, illustrated book. The weight and expense of Dresser's *Birds of Europe,* quite apart from its date, put its nine volumes out of serious consideration. *The Handbook,* although dealing in detail with most of the species he is likely to encounter, is neither handy nor for his purpose complete. It will, for instance, inform me about rare stragglers from the east, but omit the short-toed tree creeper which breeds immediately across the Channel. Wardlaw Ramsey's *Birds of Europe and North Africa* (incidentally most unaccountably omitted from the bibliography of the present volume) has, despite its age, perhaps been the most useful book, but, being without illustrations, it has had serious limitations. Consequently the bird-watcher, visiting France, has needed a separate book to help him with the crag martin, blue rock thrush, penduline tit, fantail and spectacled warblers and many others; and in Scandinavia for such birds as Ural owl, Hazel hen, Siberian jay, etc.

The present volume therefore fills a very real need, for it brings with illustrations, within one cover all these and many other (551 to be exact) species found west of 30° longitude (*i.e.* approximately the Russian frontier). Furthermore it *is* a pocket guide, and above all a field book, stressing by illustration and text the diagnostic characters of each bird from the point of view of the man with binoculars in the field, and not of the specialist in the museum with magnifying glass and colour chart beside him. A most comprehensive and excellent set of distribution maps tell the reader at a glance whether he is within the known range of a species. It avoids the key-system, which, for birds, has very doubtful merits.

Naturally, a book of this nature stands or falls essentially by its illustrations, and here Mr. Peterson has done nobly by his fellow authors. As stated in the Preface, the plates are patternistic and functional rather than portraits, and pointers indicate the most important field-marks of each bird. Where necessary, winter, summer, juvenile and female plumages are shown, and in closely allied species all the birds in that group are portrayed in the same position. Where wing-patterns are of assistance, the birds are portrayed in flight (*e.g.* ducks, gulls, waders), while there is an excellent series of the difficult birds of prey, showing the underwing patterns upon which the observer has for the most part to rely in identifying the raptors. Where critical species are likely to be caught in traps (*e.g.* the leaf-warblers) the diagnostic wing-formulae are illustrated.

In a few instances ' black ' birds (*e.g.* cormorants, vultures, crows) have been covered by line illustrations and not on art paper. The absorbent nature of the paper has detracted from a few of these, *e.g.* the griffon vulture overhead now appears much too dark and its characteristic patterning is obscured; the pygmy cormorant has lost most of its white speckles. But these are very minor criticisms. Mr. Peterson has carried out a huge task with all that care and ability we have learnt to associate with his work.

Mr. Mountford and Mr. Hollom have made the descriptive text and distribution maps respectively their main responsibilities, and both have executed their parts with distinction. The text is confined to aids to identification and therefore stresses the field-characters, and mentions such further aids as voice, and habitat. Such matters as breeding habits and display are for the most part omitted, as only in exceptional instances (*e.g.* the eggs of reed and marsh warblers) are these of any assistance in field-identification. The emphasis is on the species, and sub-species are is general ignored, except where they are recognisable in the field, *e.g.* the yellow wagtails. This is very wise policy. We have had enough of attempts at field-identification of Iceland redwings and Continental song thrushes.

In short, this field guide is a model of condensed information, and the authors and publishers alike are to be heartily congratulated, and thanked for the production of a book which will be a great boon to all ornithologists on their travels. I only wish that when I first started to pursue birds in Western Europe, I had had some such manual to assist me. Furthermore, both its price and its size put it within the pocket of every bird-watcher.

G. K. Y.

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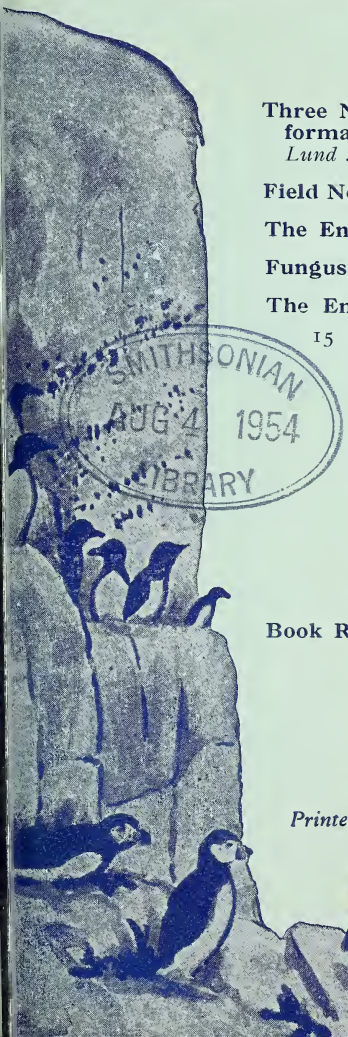

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THREE NEW BRITISH ALGAL RECORDS AND SPORE-FORMATION IN *MICRACTINIUM PUSILLUM* FRES.

J. W. G. LUND

Freshwater Biological Association, Ambleside.

Carteria radiosa Korschikoff in Pascher 1927, p. 155 f. *scherffelii*, f. nov. (*C. radiosa* Korsch. in Scherffel, 1931, p. 235), Fig. 1, A-S.

The cells (11-21μ l.; 10-19μ br.) are oval, ovoid or widely ellipsoid when young, becoming more globose as they enlarge (fig. 1, A-H). The wall is relatively thick for a species of this genus. The papilla is a low rounded (fig. 1, H) or more or less flattened (fig. 1, F, G, I, K) and elongate dome; thus it commonly appears broader and flatter from one side than from the other (fig. 1, I and J; K and L). The contractile vacuoles are difficult to see but there appear to be only two anterior ones. The stigma lies in the anterior half of the cell but never close to the apex. It is large, elliptic-oblong viewed from the broader (fig. 1, C) and lens-shaped (plano-convex) from the narrower (fig. 1, D) sides. The four flagella are arranged cruciately (fig. 1, S) and are as long as or somewhat longer than the cell (fig. 1, A, B, E-H). The chromatophore is massive and basically shaped like a basin. The large globose, oval or ellipsoid-oblong pyrenoid lies a little below the centre of the cell (fig. 1, A-D); it is often pale in colour because of the large starch-sheath. From it radiate a number of processes of the chromatophore which, on reaching the margin of the protoplast, are further produced to form pads or more irregular extensions over the inner surface of the wall (fig. 1, A-D, M-O, Q, R) and apparently anastomosing since only narrow irregular areas free of chromatophore are there visible (fig. 1, O). In optical longitudinal section up to about ten such lobes are usually visible. No such processes are directed to the apex of the cell in the area below and around the papilla so that the chromatophore is both stellate and basin-shaped. The nucleus lies in the anterior area free of these processes. The surface of the protoplast contains numerous small osmophilic granules mostly arranged in short irregularly distributed rows (fig. 1, P). Division usually leads to the formation of four, rarely two, daughter cells.

In a garden pond, Ellerhow, Ambleside, Westmorland, England.—Enormous numbers of cells occurred on and around decomposing leaves and lesser numbers in the open water. Division stages occurred on the leaves.

This alga clearly belongs to *C. radiosa* Korschikoff, the description of which in Pascher (1927, p. 155) appears to be the original one. The figure (Pascher, 1927, fig. 105) gives a rather different impression because of the greater number of narrower regular processes arising from the pyrenoid which itself is embedded in a large thickening of the chromatophore. The cells are also described as spherical though the specimen figured is almost certainly a fully grown cell. Scherffel (1931, p. 235) in his record of the species says that the rays of the chromatophore, the construction of which is not always easy to discern, are not so clear as in Korschikoff's figure in Pascher (1927). It seems probable that his alga is the same as that here described and named after him though he does not figure it. Further, he says the papilla is not sharply delimited but this may appear so if only unstained cells are examined (e.g. my fig. 1, C). A suggestion of a difference from f. *scherffelii* is given by his record of more or less clear longitudinal ribbing of the chromatophore when seen in surface view though, again, there is a hint of this in the English specimens when they are examined a little way below the surface (fig. 1, N). *C. stellifera* Nygaard (1949, p. 23) is described as having a similar chromatophore but with moving granules in the cavities between the lobes. These are presumably in vacuoles; none occur in the apical area free of lobes. The cells, however, differ clearly in the long flagella (two to three times the length of the cell), hemispherical dome-shaped papilla and the regularly spaced angular starch grains forming the sheath to the pyrenoid.

Chlamydomonas humiphilos Gerloff, 1940, p. 358. Fig. 2.

The British specimens have somewhat flattened ovoid to ellipsoid cells (17-20μ l.; 11-13μ br. in one and 8-11μ br. in the other plane). The flagella are as long as or up to one and a half times as long as the cell. The papilla is conical with a widely but shallowly excavated apex in one plane (fig. 2, A, B, D, E, G) and a low wide dome (fig. 2, C, here rather irregular; F) or somewhat rounded cone in the other. There are two anterior contractile vacuoles and a rather irregularly oblong shaped stigma lying almost equatorially or in the anterior half of the cell (fig. 2, F). The chromatophore is basin-shaped (fig. 2, A-G) with the margins and base irregularly thickened

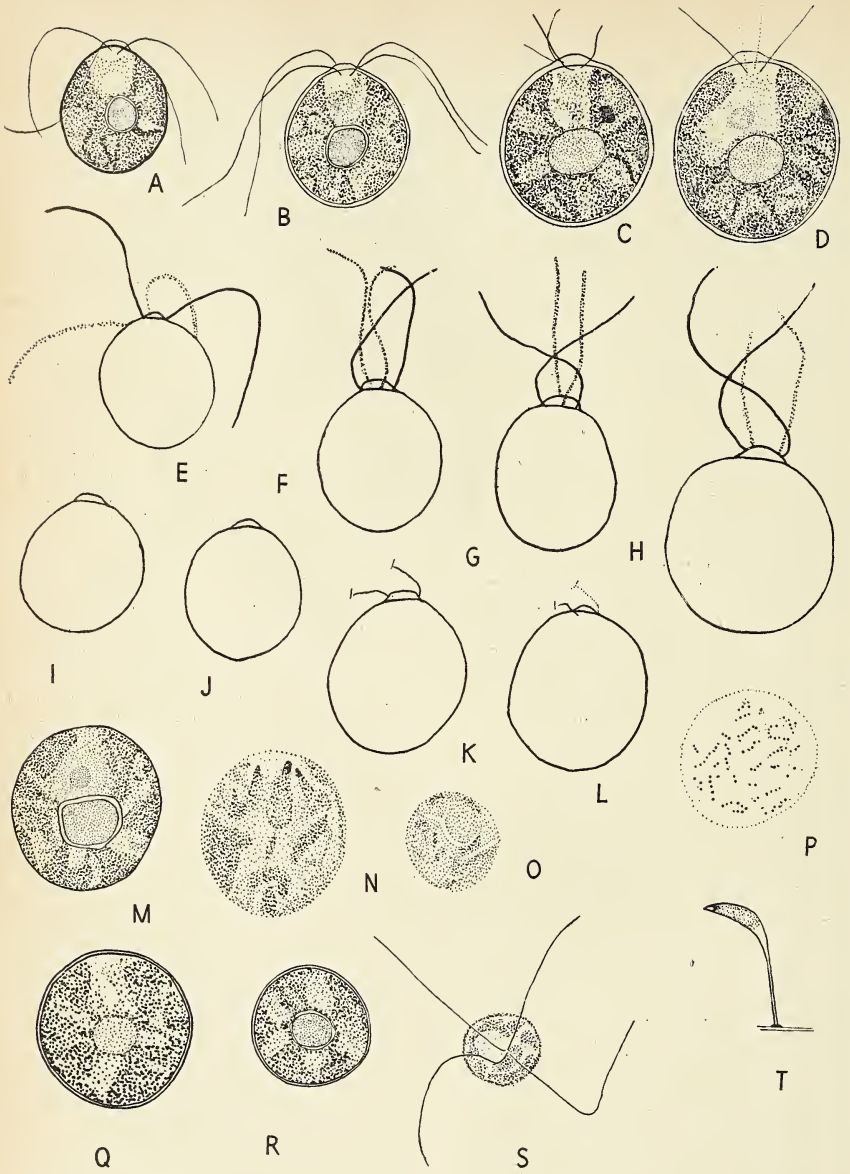

FIGURE 1. *A-S*, *Carteria radiosa* Korsch f. *scherffelii* f. nov. *A-D*, Cell contents; *E-L*, shape of cell and papilla; *I* and *J*, the same cell seen in two optical longitudinal planes at right angles to one another and *K* and *L*, another such cell; *M-O*, the chromatophore of a cell in optical longitudinal section (*M*) and at levels 5μ (*N*) and 9μ (*O*) above; *P* osmophilic granules in the surface of the protoplast; *Q*, *R*, cells in transverse optical section, *S* cell apex seen from above (papilla not shown). *T*, *Characium ornithocephalum* A. Br. var. *harpochytriiformis* Printz. *E-L*, stained in alkaline gentian violet in aniline water, the rest killed in osmic acid. *A-S* × 1250, *T* × 640.

(fig. 2, A, D, E), in some cells there is no basal thickening when the cell is viewed from one or both sides (fig. 2, C, G). There is most often one large laterally-placed pyrenoid (fig. 2, C, E-G) generally embedded in a thickening of the chromatophore (fig. 2, C, G), but not uncommonly there are two pyrenoids lying on opposite sides of the cell (fig. 2, B) and very rarely there are three (fig. 2, A). Two to four daughter cells (fig. 2, H, I) are formed, the parent cell reaching 18-20μ br. before they are liberated. The mutual flattening of each pair within the parent membrane sometimes persists after liberation (fig. 2, C). Sexual reproduction leads to the formation of a globose to widely oval zygote (*circa* 13-17 by 14-18μ) with a pale brown wall, the

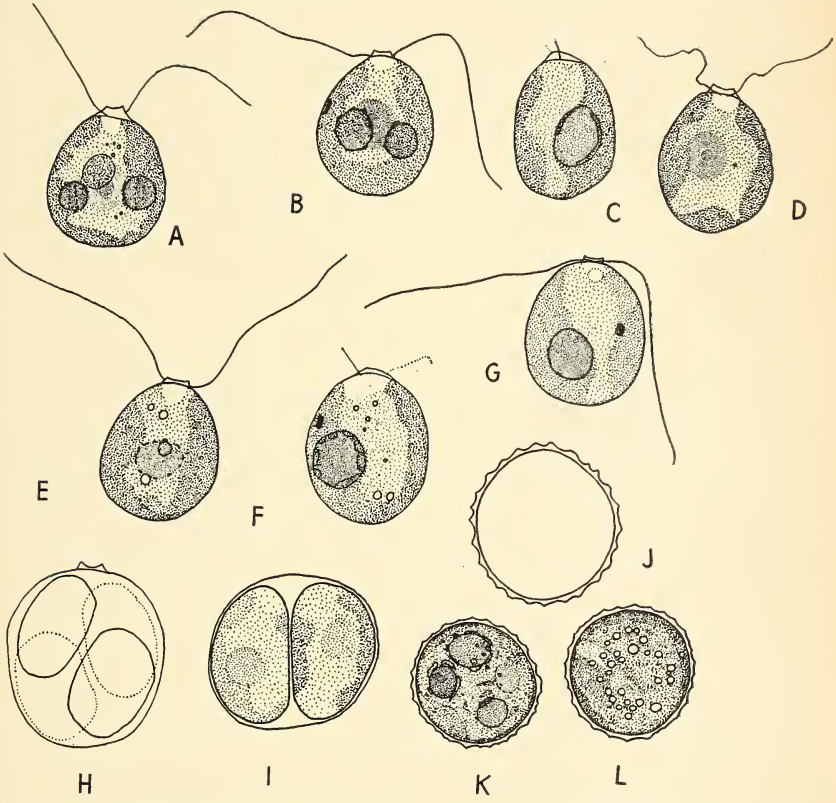

FIGURE 2. *Chlamydomonas humiphilos* Gerloff. *A*, cell with 3, *B* with 2 and *C-G* with 1 pyrenoid; *C* and *D* a cell seen in two longitudinal planes at right angles to one another; *H*, *I* division into 4 and 2 daughter cells; *J-L*, zygotes, *K* showing 4 pyrenoids. All killed in osmic acid and × 1250.

outer margin of which is covered by shallow saucer-shaped depressions of somewhat irregular shape and size so that in optical section the margin appears irregularly serrate (fig. 2, J-L). Within is a massive chromatophore containing two to four pyrenoids (fig. 2, K) according to the number present in the gametes.

In a water butt in the garden of the Windermere laboratory of the Freshwater Biological Association.—Sometime before the alga appeared this had had soot and manure added to the rain water in it.

In general, the British specimens agree closely with those grown in culture by Gerloff (1940). The cells are generally less elongate and more ovoid and the papilla in one plane somewhat flatter than was usual in Gerloff's specimens. Gerloff found that this species is monoecious (homothallic) and isogamous while very rarely 4-5

pyrenoids were present. The latter may have been related to the onset of division as in Skuja's (1949) *C. uppsaliensis*. In cultures containing high concentrations of salts or deficient in one or more nutrients Gerloff obtained palmella stages which have not been seen in the British material.

C. uppsaliensis Skuja (1949) is very similar but is heterogamous and the zygote is oval to oblong-ellipsoid with a finer more regularly serrate outer margin which is repeated on the inner side of the wall. There is no basal thickening to the chromatophore, the stigma is oval to spherical when observed from the broad side and the papilla in the plane of flattening of the cell is much narrower with a more-or-less acute apex. *C. terricola* Gerloff (1940, see also Lund, 1940 for British specimens) has a papilla which, in both planes, is truncate conical with an excavated apex, a very large pyrenoid which is very rarely laterally placed so that the chromatophore is usually regularly cup-shaped and a different wall structure to the zygote.

Characium ornithocephalum A. Br. var. *harpochytriiformis* Printz, 1914, p. 39. Fig. 1, T.

The cells (39-40μ l.; 4μ br.) agree exactly in shape and size with the original description of Printz although he figures some smaller cells (1914, Pl. II, figs. 38, 39)

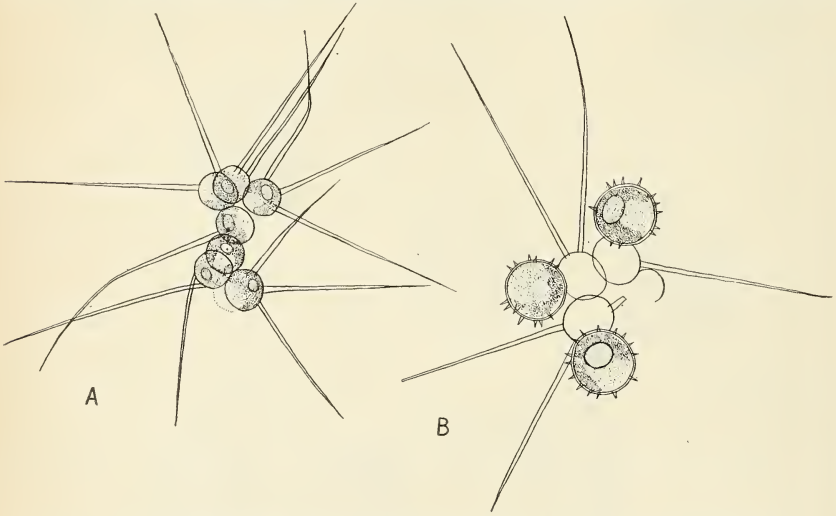

FIGURE 3. *Micractinium pusillum* Fres. *A*, vegetative colony, and *B* one with empty cells and presumed oospores. Alive, × 830.

which are presumably not fully grown. The cells are falcate, about ten time as long as broad, with a long ($\pm$ 20μ) narrow ($\pm$ 1μ) stalk standing vertically from the substrate to which they are attached by a small disc. The body of the cell is at an angle of 90° or somewhat less to the stalk and is arcuate to lunate narrowing to an acute apex. There is a single parietal chromatophore which neither reaches the apex of the cell nor extends into the stalk. I have not been able to observe the small globose body which is figured by Printz (1914, Pl. II, figs. 34-39) and is presumably a pyrenoid.

A few cells occurred on an *Oedogonium* which had developed in a sample of plankton from Blelham Tarn, Lancashire, which had been left standing in a shaded window for some months.

Oospores (?) of *Micractinium pusillum* Fres. Fig. 3.

Probable oospores of this alga were present in plankton collected by Mr. G. A. Farrow from Eresby Canal, Spilsby, Lincolnshire, in May, 1952. The globose cells (10-12μ diam.) with short relatively thick spines occurred in colonies containing empty cells (fig. 3, B) and agree with those described and figured by Korschikoff (1937, Pl. 5, fig. 5) and Nygaard (1949, pp. 36-37, fig. 11) though the latter records cells up

to 17μ diam. As in Nygaard's case I did not find any evidence for the sexual nature of these cells but, as no young stages were seen either, this may well have been because fusion had been completed earlier. However, it is possible that these are parthenospores such as Korschikoff (1937) found in *Golenkinia solitaria* Korsch. He says of *M. pusillum* that the protoplast of the ovum may protude somewhat before fertilization ' and it is not improbable that here parthogenetic cysts may be formed . . . after a complete outlet of the egg cell from its wall.' Nygaard (1949) observed the presence of two protoplasts of equal size in some of the spores and suggest the possibility of isogamy unless they represent the first division of the oospore. The latter interpretation seems to me to be almost certainly correct both from Korschikoff's (1937) observations on this and two *Golenkinia* species and from the fact that this stage occurs in a cell with fully developed wall and spines.

Korschikoff (1937) is ' of the opinion that *Erreralla bornhemiensis* Conrad (1913) is so similar to *Micractinium pusillum* that there is no reason to maintain the genus *Erreralla* as independent.' I have observed both these algae together in plankton from the Norfolk Broads but unfortunately was unable at the time to study them. My impression was, however, the same as that of Korschikoff. Certainly the cells in the colonies of *M. pusillum* may be more or less pyramidately arranged though more than one spine may be present on a cell (see also Smith, 1926).

My thanks are due to Mr. G. A. Farrow of the Lincolnshire Rivers Board for collecting plankton, to my wife (Dr. H. M. Canter) who discovered *Carteria radiosa* f. *scherffelii* and Professor F. E. Fritsch for bringing Scherffel's (1931) paper to my notice.

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FIELD NOTES

A Diatom and the Cold Spell.—The very severe cold spell, February 27th—March 2nd, was the cause of a remarkable growth of a diatom in the stream at Austwick. The first note was made by S. Crompton on March 8th but it may have been there a day or two earlier. The stream appeared to have turned from clear water to a very peaty colour when looked at from the bridge, though peaty water has not been previously noted in this stream. A few days later it was seen that the water was quite clear and that the change of colour was due to a coating of algal matter on the pebbles in the stream bed. On examination this was found to be all one species of diatom, a form of *Tabellaria flocculosa*. It was evident that the intense cold spell had given this particular plant a condition to which it responded vigorously producing an incredible amount of growth, covering the pebbles and

vegetation until the whole took on the brown colouration. As the weather got milder the plant was seen to get less and a search on the 19th showed that there was none left though a small amount of *T. flocculosa* is generally to be found at all times.—Chris. A. Cheetham.

An Observation on the Cuckoo.—The following incident was observed by Mr. Adam Gordon of Helmsley from his sitting-room window:

A pair of house sparrows and a pair of pied wagtails had built their nests about six feet apart in the roof of an outhouse and a cuckoo was evidently aware that the latter were nesting thereabouts. It made the mistake of first visiting the nest of the house sparrows and seemed most surprised by what it found there and assumed a wild, tight-feathered appearance. It then hunted around until it found the pied wagtail's nest when it fluffed out its feathers and assumed a round contented look. The cuckoo then retired a short distance, presumably to wait until its egg was ready for immediate laying when it backed up to the wagtail's nest, laid its egg and carried away one of the wagtail's eggs between its mandibles. This it crushed with its head held high, so that the contents drained down its throat, before throwing away the empty shell with a flick of its head. An examination of the rejected shell showed the presence of blood and evidently the wagtail's egg had been incubated for several days.

Meanwhile the behaviour of the wagtails and house sparrows was that of welcoming an honoured guest and not alarm as might have been expected.—E. Wilfred Taylor.

The Trumpet Ramshorn Snail, *Menetus* (*Micromenetus*) *dilatatus* (Gould) east of the Pennines.—In 1869 an American freshwater Gastropod *Menetus* (*Micromenetus*) *dilatatus* (Gould), perhaps more familiarly known as *Planorbis dilatatus*, was found near Manchester. Since that time it has been encountered in various localities within the vicinity of that city, especially in canals to whose continuity its dispersal seems to be chiefly due, but, with one remarkable exception it has never been recorded at any great distance from the original locality and appears never to have been previously recorded east of the Pennines. The exceptional record is for the island of Raasey (Inner Hebrides), which has never been confirmed. There is one Yorkshire record, made in 1917, namely for Waterhead, near Oldham, a region which, while politically Yorkshire, is geographically part of Lancashire. It is of interest therefore to record that *M. dilatatus* occurs in Yorkshire to the east of the Pennine watershed, for I have taken it in the canal at Golcar, near Huddersfield, where, at one point, it is not uncommon.

It seems probable that the species owes its presence there to the continuity of the waterway in which it occurs with its South East Lancashire stations for until recent years active barge traffic was maintained on this, the Huddersfield-Ashton canal, between Yorkshire and Lancashire *via* the three-mile long Standedge tunnel, and attachment of the snail or its eggs to a barge would constitute a ready means of transportation through what would otherwise be an apparently unsurmountable obstacle.

This snail was first noticed at Golcar more than two years ago, at which time I was not certain to what species it should be assigned. A recent re-encounter led me to examine specimens more carefully and ascertain their exact identity. I have not had the opportunity of searching for it in other parts of the canal, so its exact distribution in this locality remains to be worked out. Where it does occur I have taken it among *Acorus calamus* L. and on the submerged roots and stems of *Lycopus europaeus* L., where it occurs in company with another snail which is, like itself, of comparatively recent origin in the inland waters of Britain, namely *Hydrobia jenkinsi* Smith, which is now very common in the Huddersfield district.

The discovery of this snail at Golcar completes a trio of introduced organisms whose true home is in the New World, for the bed of Sweet Flag in which it occurs, and which is itself of American origin, harbours also large numbers of the North American Amphipod *Grangonyx gracilis* (S. I. Smith).

Mrs. E. M. Morehouse and Mr. A. E. Ellis kindly checked my provisional determinations and the latter supplied details of the previous Yorkshire record.—G. Fryer.

THE ENEMIES OF LEPIDOPTERA

FRANK HEWSON

Most Lepidopterists who interest themselves in rearing the insects are only too familiar with such common enemies of caterpillars as ichneumon flies. It is less well known that many other enemies are likely to be encountered.

One would hardly expect such an aerial creature as a caterpillar to be in danger from a water-inhabiting creature such as an eel, yet at a meeting of the Entomological Society of London in 1882 Mr. J. Jenner reported one rising to take a caterpillar from the edge of a leaf. This detail appears in *The Entomologist's Monthly Magazine* (1886, 115).

The mole is well known to include insects in its diet, but a somewhat unusual one was seen by G. B. Gooch, of Trinity College, Cambridge, ' tearing open and apparently trying to get inside a stem of the reed-mace, *Typha latifolia*, presumably in quest of caterpillars of *Nonagria arundinis* (the Bulrush Wainscot), a number of which, together with some pupae, I found in adjacent stems of the same plant. I examined the stem that had been opened by the mole, and two others similarly opened, and found that the caterpillars had been extracted . . . The locality was Chesterton, Cambridge.' This is recorded in *Ent. mon. Mag.* (1927, 196).

Such records as these make enthralling reading for me. For some years circumstances have prevented me being an outdoor naturalist. This has merely served to stimulate an already keen appetite for reading, chiefly entomological literature, searching for records of the occurrences of local lepidoptera, but also indexing extracts of other interesting phenomena.

To a lepidopterist ichneumon flies are amongst the best-known enemies, attacking any of the first three stages. The majority of female ichneumons search for caterpillars in order to lay their eggs either on or in them. The ichneumon grubs usually feed on the liquid intestines of the caterpillar until they are almost full-fed and then make a meal of the vital organs, thus causing the death of the host. The latter detail, however, is not invariable, and caterpillars which produced imagines in spite of internal hymenopterous or dipterous parasites are recorded. *The British Naturalist* (June 1894, 146) reports a meeting of the City of London Entomological and Natural History Society at which a Mr. Lewcock exhibited a small but perfect female specimen of the Brindled Beauty moth, from which a parasitic larva had emerged and had since become a pupa. *The Entomologist* (1903, 221) reports a meeting of the Entomological Society of London at which Dr. T. A. Chapman exhibited a cocoon of *Orgyia auro-limbata* (one of the European moths) which contained a cocoon of a microgaster (a braconid fly); the moth was so fully developed as to contain a few eggs. In *Ent. mon. Mag.* (1884, 227), G. J. Hearder writes of a larva of the Sallow Kitten, which ' . . . being full-fed, showed symptoms of serious internal disease, which was not relieved by the appearance of the pupa-case of an ichneumon projecting through the skin of the larva. The projecting portion of the pupa-case was crushed between forcep blades, and thus allowed to remain in situ. The larva afterwards made a well-formed cocoon, from which, in due time, emerged an imago, with the left hind-wing somewhat crippled, but otherwise a perfect insect.'

In *Ent.* (1882, 163), C. E. Newman states that when taking a fairly good specimen of *Chelonia plantaginis* (the Wood Tiger) off the setting board he found an ichneumon larva (about half an inch long) spun up between the insect and the board, and saw a large hole in the abdomen of the insect out of which the larva had evidently come.

In 1884 A. F. Griffith sent to the editor of *Ent. mon. Mag.* a pupa in which the moth had apparently died when just ready for emergence, but within the body a live parasite. The editor observes (*loc. cit.* July 1884, 35) that ' this is a very curious instance of parasitism. The moth, apparently *Taeniocampa stabilis* (the common Quaker), had so far developed that head, antennae, proboscis, legs, thorax and wings were perfect, but the abdomen was entirely occupied by the pupa of the parasite, a *tachina*, leaving nothing between it and the pupa-skin of the moth except the skin and scales. The fly must have died when the moth-pupa was opened, as it has not spread its wings.'

In *The Naturalists' Journal* (December, 1896, 3), the Rev. A. P. Morres reports that when stuffing the body of an imago of the Death's Head Hawk-moth he pulled out a cylindrical maggot half an inch in length, theorizing that had he not forced the pupa the parasite would have developed and killed the host. Much to my

surprise the editor's footnote asks ' But why did not the forcing hasten the development of the parasite?,' since it seems apparent that the pupal period of the moth is much more easily shortened by forcing than is the larval period of the parasite.

Dr. E. A. Cockayne (*Ent.*, 1911, 253) reports the emergence of a larva of a dipteron, *Phryxe vulgaris*, from an imago of the Rannock Brindled Beauty, the dipteron being duly reared, though in this case Dr. Cockayne thinks it possible that the lepidopteron was not stung in the larval stage but as an adult. J. W. Tutt in his monumental work upon *British Lepidoptera* mentions some of these and one or two other similar occurrences.

These are the exceptions; usually the parasite completes its task, being very well equipped to do so. In some cases a single parasite only appears from the host, in others, small parasites from large hosts, they may be in numbers. According to C. P. Clausen, in his volume *Entomophagous Insects*, the record from a single host is round the two thousand mark, hymenopterons of the genus *Litomastix* bred from various American moths. It may be questioned as to how the adult parasite could lay so many eggs as to produce such a large brood, and the answer is in polyembryony, by which as many as five hundred progeny may hatch from a single egg. ' With an average deposition of 75 eggs per female and on the assumption of 500 progeny from each egg, there is the possibility of a female giving rise to nearly forty thousand progeny.'

According to the same source the ovaries of a gravid female of *Apanteles glomeratus* (the familiar ichneumon of our Cabbage White butterflies) are said to contain upwards of 2000 eggs, and 15 to 35 are deposited at one insertion of the ovipositor.

In his work *British Lepidoptera* J. W. Tutt quotes an observer named Mera that ' The larvae (of the Eyed Hawk-moth) are greatly affected by ichneumons in the London district, often not five per cent. being free from their attacks; it is easy to detect those stung as the blue caudal horn becomes green and has the appearance of the extreme tip having been bitten off.' I myself noted that various larvae with a ' nipped ' appearance on the ninth or tenth segment produced parasites, and this observation was mentioned in *The Naturalist* (1947, 149), but as yet I have had no confirmation from other observers.

Earwigs have been noted as beneficial when attacking a plague of larvae, but as a nuisance when killing larvae which the observer wished to rear. Eggs, too, are eagerly eaten by them. H. Eltringham (*Butterfly Lore*, p. 30) has a most interesting account of an earwig following a female Large Yellow Underwing, breaking and eating the eggs almost as fast as they were produced.

Tutt (*Brit. Lep.*, **4**, 214-5) quotes Weisman (*Studies in the Theory of Descent*), who states that a lizard which would not eat a caterpillar of the Bedstraw Hawk-moth at once attacked and swallowed a large caterpillar of the Spurge Hawk-moth, whilst Mathew states that in Malta the caterpillars are much attacked by centipedes and that carnivorous beetles prey on them at night. In a later volume, published in 1908, Tutt quotes Floersham (*Entomologist's Record*, **18**, 39) as observing spiders and larvae of Ladybirds attacking and killing caterpillars of the Swallowtail butterfly. The spiders would even attack full-grown caterpillars, which soon died and turned black.

A bug, *Picromerus bidens*, has been mentioned on various occasions. Mr. P. Inchbald (*Nat.*, 1865, 270) gives details of a field-day on Strensall Common on October 7th, 1864, stating: ' The pretty larva of *Clostera reclusa* (the Small Chocolate Tip) which was feeding on the dwarf willow, was being sucked by a large hemipteron, which has the name of *Picromerus bidens*. We saw several empty skins of this caterpillar during our rambles, nor is its enemy very particular as to its diet, as it will attack the hairy caterpillars as well as the smooth ones ! '

This was borne out by Prof. E. B. Poulton in his article ' Predaceous Insects and Their Prey ' in *Trans. Ent. Soc. Lond.* (1906, 404), where he remarks that it has been recorded as found on and apparently eating the dead caterpillar of *Bombyx rubi*, the Fox moth.

F. H. Haines of Ringwood, Hampshire, reported (*Ent.*, 1929, 232) that a number of *Picromerus bidens* had completely destroyed a large brood of caterpillars of the Buff Tip moth, and (*loc. cit.* 1941, 71) he had a further note of its attack on an imago of the Striped Wainscot moth. That these bugs do not confine their attacks to caterpillars is also borne out by other observers. At a meeting of the Ent. Soc. of London on November 17th, 1915, Prof. Poulton exhibited the Pentatomid bug, *Zicrona coerulea* and the butterfly referred to in the following letter from Dr. E. A.

Cockayne, dated July 26th, 1915: ' I enclose you a freshly emerged male Chalk-hill Blue, taken at Royston, Herts., July 25th, 1915. The two brilliant green bugs were sucking it, one attacking the thorax, the other the abdomen.' Other references will be found in *Ent.*, Oct. 1927, Dec. 1929 and Jan. 1934. Closely related species of bugs, *Troilus* (*Podisus*) *luridus* and *Anthocoris nemorum* are also recorded in similar activity.

In a report (*Ent.* 1918, 22) of a meeting of the S. London Ent. and Nat. Hist. Society, Mr. Hugh Main records the large green grasshopper, *Tettigonia* (*Locusta*) *viridissima*, as feeding readily on caterpillars of the Large White butterfly when offered to it. Prof. Poulton, in the article previously mentioned, points out that *viridissima* is a well-known visitor to ' sugared ' posts for the purpose of attacking the moths, having been seen over and over again. Further references will be found in *Ent. mon. Mag.* (1887, 190), and in *The Young Naturalist* (Jan. 1887, 17).

The common flea, *Pulex irritans*, is recorded as feeding on caterpillars in *Ent.* (1882, 70) by Charles J. Boden, who took home from a warehouse some caterpillars feeding on peas, and discovered that larval and later adult fleas were feeding on the caterpillars.

Mr. T. Bainbridge Fletcher's report (*Ent.*, 1936, 192) of midges attacking several small green geometrid larvae hanging on threads from Whitebeam led a prominent dipterist, Mr. F. W. Edwards, to observe: 'A number of instances have been placed on record of Ceratopogonid midges sucking the blood of caterpillars, the victims being generally large smooth larvae such as those of the Sphingidae, and the aggressors members of a particular section of the rather complex genus *Forcipomyia*. Two or three species of this group of midges are known to occur in Britain, but their feeding habits have not hitherto been observed in this country. Early this year, however, Mr. T. Bainbridge Fletcher submitted to me specimens of one of these species (*F. pallida* Winn., or a closely-related species) which were taken feeding, . . . The fact that these midges were taken at night may be significant; perhaps Lepidopterists who hunt for larvae at night may be able to provide further examples of this form of parasitism.'

Undoubtedly we can include human beings in our list of enemies, but surely the strangest of these is a certain Frenchman. These are the words of D'Isjonvalle: ' The celebrated Astronomer often supped with me on Saturdays, and found nothing more to his liking than to eat caterpillars and spiders when in season. As my room opened directly on to a fine garden, he easily found the wherewithal to satisy his first hunger; but as Madame D'Isjonvalle likes to do things well, she used to collect some during the afternoon, to offer him on his arrival. As I always declined my share of this relish, I can only trust to hearsay for the difference in flavour between a spider and a caterpillar. The first, says our astronomer, has a nutty taste, the second a taste exactly like that of stone-fruit.' The foregoing is a translation from *Le Naturaliste* which appeared in *Ent.* (1900, 87).

I am reminded of a story for the truth of which I cannot vouch. A boy of six and one of nine were sent to pick caterpillars off a large cabbage-patch. Called in some time later the elder boy had half a tinful, the younger had none, and when asked the reason for this, and why there were green streaks from the corners of his mouth, replied, ' Oh ! I eats 'em ! '

The Naturalist of 1890 carries an extract from the *Yorkshire Folklore Journal* of 1886 and 1888. A cure for warts was that long-haired caterpillars, found in hedges and called ' Tommy Tailyers,' should be thrown over the head. As a cure for whooping-cough one should catch a live hairy worm (a woolly boy) and hang it in a bag from the child's neck, the cough would waste with the worm.

Caterpillars of certain species of butterflies and moths are well-known as cannibals, eating other weaker caterpillars or any which have affixed themselves for pupation. These include those of the Green Hairstreak, the Holly Blue and Orange Tip butterflies, whilst few books on Lepidoptera forget to mention the Dunbar as the most cannibalistic of all.

Referring to the Holly Blue (*Ent.*, 1927, 221), E. M. Town-Jones writes 'Among some *Lycaenopsis argiolus* larvae which I collected in June, one which had 'anchored' itself ready for pupation was attacked by a half-grown specimen. The head of the cannibal was completely buried in the flesh of the victim towards the hind end (the dorsum of about the eighth segment) and I had some difficulty in removing the offender. The injured insect duly pupated a day or two later, and recently a fine female imago emerged. I bring this case forward because it is the first time that I have ever known a gross lesion to be non-fatal to a caterpillar . . .'

Slugs are generally regarded as feeding on vegetable matter, yet (*Ent.*, 1890, 69) they are noted as attacking young larvae of the Oak Eggar moth in Monmouthshire. Ants have been noted as destroying eggs, caterpillars and pupae, and even capturing butterflies. Mice are very fond of moth pupae, chiefly noted by people who rear moths in captivity, whilst at a meeting of the Manchester Ent. Society in 1942 ' H. Britten remarked that certain wireworms, such as those in the genus *Athous* Esch., will devour the pupae of Lepidoptera, such as *Cerapteryx graminis* L., and suggested that those in the genus *Corymbites* Lat. probably do the same.' (*Ent.* 1943, 112.)

Turning to the enemies of adult butterflies and moths, toads are recorded by two observers (*Ent.*, 1875, 137) as waiting at sugar patches for the intoxicated moths to fall into their clutches. G. B. Corbin stated: 'A friend of mine was accustomed to sugar the post of an open fence near his house, and was sometimes rewarded with success. One of these posts becoming infirm a support was placed in an oblique direction from near the top of the post to the ground, and my friend, on going to his sugar, observed that a large toad had crawled up the support and stationed itself close to his sweetened patch of intoxicant, and that as the insects arrived at the attractive bait the toad appropriated them to its own personal use. Every night he sugared the toad was sure to be there. Is this not proof that toads have a memory? At least it is evident that the toad, having found a more abundant or palatable fare by crawling up the rail, did not fail to be at its post night after night.'

J. G. Simes mentions (*Ent.*, 1948, 250), observing a frog capturing a butterfly at the top of the Simplon Pass, going on to say ' . . . These damp hollows on the Simplon are full of these large frogs and I think they must be regarded as really formidable enemies of butterflies. They are probably the principal enemies, for there are very few birds at that altitude.'

Mr. G. V. Bull (*Ent.*, 1929), wrote ' Creatures other than moths have been unusually numerous at sugar this year. On June 15th I watched a red centipede attack three moths in succession. It fastened on the underside at the junction of the abdomen and appeared to be sucking. The first two (the Small Square-Spot and the Bright-line Brown-eye) were strong enough to cling to the tree and resist capture, but the third (a Marbled Minor) was triumphantly carried off. The same creature was several times seen later with Crambids in its jaws. Later a black beetle was found with a Dark Arches moth in its jaws.' Many years previously (*Ent.*, 1875), Mr. G. F. Mathews, writing upon *Doings at Sallows*, stated ' Several *Taeniocampa cruda* (the Small Quaker) fell on to my sheet in the clutches of a pallid-hued spider; and on a log of wood lying on the ground I saw a centipede busily occupied sucking the juices of another, which it had doubtless captured while it was in a state of unconsciousness.'

Charles Mosley, of Huddersfield, recorded (*Ent.*, 1926, p. 254), a cat which for at least two years made a habit of catching and eating white butterflies, whilst P. Siviter Smith notes (*loc. cit.*, 1945, p. 190), a cat which was adept at this pastime and which ' was particularly proud of a male Convolvulus Hawk-moth which it captured and destroyed on August 20th 1945.'

It is well-known that wasps provision their cells with caterpillars for their grubs to feed upon, but probably less noticed are the records of both wasps and hornets capturing adult butterflies, the procedure being for the wings to be bitten off and the rest carried away. That butterflies are not altogether defenceless is shown by a note in *The Amateur Entomologists' Society's Bulletin*, October, 1945, where the Rev. W. O. W. Edwards wrote: ' Many butterflies and moths are strongly attracted by the odour of trees infested by Goat moth caterpillars. A friend and another naturalist came upon an infected tree, on and around which were crowds of Red Admirals and a host of excited and pugnacious wasps, who strongly resented the presence of their adversaries. A terrific fight was being waged, and the two friends stood spellbound and watched the fray. The butterflies resting on the trunk turned and faced their enemies as they advanced. With wings folded, they waited for the right moment, and then down came their wings with a bang and crushed it against the tree. The wasp dropped dead or badly stunned. Sometimes *atalanta* (the Red Admiral) was not quick enough, and the wasp seized its prey. So the war went on, and upon the ground lay numerous wasps dead and dying, and many Red Admirals wounded and wingless. To me it seems marvellous that a butterfly possesses sufficient strength in its wings to crush a wasp, which usually takes a lot of killing.'

Lest anyone should think this account too highly coloured I may point out that

no less an authority than J. W. Tutt accepted the evidence of an observer whose attention was drawn to a battle ' between a Purple Hairstreak butterfly and a wasp, in which he was surprised to see the undaunted pluck of the former. The butterfly repeatedly charged the wasp in a most furious manner; he never attempted to fly away, but stuck to his opponent with bulldog courage. The scene presented the appearance of a miniature cockfight. At length the wasp altered his tactics, and, as the butterfly made a charge, with wings erect, he dodged on one side, and whipped off a portion of his wings; this trick he repeated until the butterfly's wings were half-destroyed, and, seeing that he would shortly fall a victim to his cunning opponent I captured him, and now have him in my cabinet.' This report will be found in Tutt's *Brit. Lep.*, **9**, 265.

Various species of mites have been found on adult butterflies and moths, and some observers have theorised that the mites are merely using the host as a means of transport to pastures new, for instance the following note (*Ent.*, 1924, p. 209), from Mr. A. S. B. F. P. Wynne: ' Thanks to the kindness of our editor, I have been able to identify a curious little vermilion-coloured mite, of which I found three specimens on the thorax and forewing of the Rustic Shoulder-knot moth on June 10th, 1924. Mr. Riley put me into the hands of Mr. S. Hirst, of the British Museum, and he tells me it is *Cheletomorpha venustissima*, one of the so-called book-mites. Mr. Hirst tells me it is found in dust in rooms and stables and in stored grain, straw, etc. I doubt whether it is really detrimental to the Lepidoptera. It seems more likely that it uses the moths as a means of transport, to get from one breeding-ground to another, just as the oil beetle in its larval state uses the humble bee . . .'

Another species of mite is said to be the larval form of a species of *Belaustium*. The *A. E. S. Bull.*, No. 87, p. 126, has a report from K. H. Bobe, who found a Small Tortoiseshell butterfly so heavily infested by an unidentified species that it was unable to fly, whilst in *Bull.* 99, A. P. Major gives the following report: ' On November 15th, 1948, four Small Tortoiseshell butterflies emerged in my breeding-cage indoors from pupae bred from wild caterpillars. Some days later I noticed that three of them had not moved from where they had hung themselves to dry their wings, and found them to be swarming with small red mites. By the 24th November the three were dead, their bodies being almost shrunk away.' There are many more records of mites on butterflies and moths, and a few of them having been found on caterpillars.

Hairworms or threadworms have been noted in butterflies and moths. A meeting of the S. London Ent. & Nat. Hist. Society on May 24th, 1888, received a good deal of publicity, reports appearing in three different magazines for that year, *Ent. mon. Mag.*, 40, *Young Nat.*, 141, and *Ent.*, 191. Each report is similar and to quote the latter ' Mr. Jager exhibited a larva of *Nemeophila plantaginis* (Wood Tiger moth) which he had found dying, partially covered with mould; and on examination he had noticed a small larva (also exhibited) emerging from the caterpillar. Mr. West stated that the larva which Mr. Jager had found emerging from the *plantaginis* larva was that of the hair-worm, the ova (*sic*) of which had probably been swallowed by the larva of *plantaginis* while feeding.' Reports from the same society (*Ent.*, 1911, 372-373), state that at the meeting on July 27th, 1911, Mr. Jager exhibited a nematode worm which had emerged from the larva of a *Cucullia* (one of the Shark-moths), and at the meeting on August 24th, Mr. Turner contributed a note on the habits of this thread worm.

In *Nat.*, 1892, J. H. Fowler reports: ' In the New Forest, last July, I netted a good series of the Gatekeeper for the purpose of obtaining a well-marked series, and upon taking them off the setting-boards, I observed something peculiar in the appearance of a very large female. This proved to be a worm; it had partially come out from between the jointure of the head and thorax. In colour it was light brown, polished; head blunt, and about the thickness of a coarse horse-hair. It emerged spirally, and I should say, if straightened, would be quite an inch and a half long; but how much is still in the butterfly I cannot say. Both are well preserved, the parasite lies over the body of its host but in drying has slightly discoloured.' The Editor's footnote remarks—' This is probably a *Filaria*, one of the Nematode worms. Such parasites have been detected in beetles and earwigs. In some instances the worm has been found to measure fully two inches in length.'

The insectivorous plants have no respect for the beauty of butterflies, and the Silver Studded Blue, the Large Heath and the Meadow Brown butterflies have all been observed on the Sundew.

A list of indirect enemies may be made, for instance it is theorised in *The London Naturalist* for 1926 that rabbits were responsible for the disappearance of a colony of Chalkhill Blue butterflies from a chalkpit near Oxted, presumably the rabbits had eaten all the food plant.

At a meeting of the Royal Entomological Society on December 7th, 1949 ' Mr. R. L. E. Ford recalled that on one occasion when " sugaring " for the Red Underwing moth he found the wings of all the specimens taken in one particular spot were crumpled. On investigation he discovered that the ground there had been used by cows when sheltering, and suggested that the consequent trampling of the pupae accounted for the deformities.' This report appears in *Proc. Ent. Soc.*, 1949, **14,** 49.

A note from Mr. A. M. Morley (*Ent.*, 1948, 100), records his attempt to rear the Clouded Yellow and Pale Clouded Yellow butterflies. He writes: ' Unfortunately the small larvae did not flourish. Greenfly attacked the plants which were growing in pots and sucked the juice out of the leaves. The larvae lacked the intelligence to transfer themselves to unaffected leaves, with the result that most of them perished through inanition before the greenfly were destroyed. Many of the survivors were devoured by three small spiders which had concealed themselves in the cage and grew exceedingly fat before they were discovered.'

In conclusion perhaps it would be of interest if I were to point out that caterpillars are not invariably merely the prey of other creatures. A few are entomophagous instead of phytophagous, that is insect-eating instead of plant-eating. In addition to the occasional cannibalism previously mentioned some species regularly feed upon other insects. Probably the best known case is that of the Large Blue butterfly caterpillars. The adults mostly lay their eggs on plants beneath which ant colonies are located. The young caterpillars are plant feeders. Later they refuse such food and find their way or are carried into the ant nest, where they feed upon the ant larvae and pupae. A pronounced cannibalistic tendency is shown by the caterpillars during the plant-feeding period, they will readily eat other caterpillars they come across, which they will not do after entry into the ant-nest. Only about a fortnight is spent on plants, almost ten months is spent underground, though this includes the winter hibernation.

In other parts of the world there are species whose only food is insects. In Australia caterpillars of *Liphyra brassolis* feed upon the larvae of a tree ant, and another species feeds upon mealybugs. In *Trans. Ent. Soc. Lond.*, 1905, 1-4, Kershaw gives details of a Chinese species ' *Gerydus chinensis* and its connection with aphides, chiefly those frequenting various species of bamboo, the eggs being laid among a mass of them. They hatch in about four days . . . The larvae feed on the aphides, pressing them against the plant with head and forelegs, sometimes holding them in the forelegs quite away from the plants; a few bites dispose of an aphis, and the larva then licks and cleans its legs, just as a mantis does; some aphides must have a better flavour than others, as the larvae pick and choose, moving their heads up and down over the backs of the insects, evidently smelling them . . . The larval state lasts about fifteen days and it was reckoned on the average, from first to last, that a larva ate some twenty aphides per day, but it would require many larvae to make much impression on the crowds of aphides one often sees, for often a yard of bamboo stem, two or three inches in diameter, is absolutely covered with these insects.' In 1947 the *Proc. Roy. Ent. Soc. Lond.* gave details of a moth caterpillar new to science, *Fulgoraecia cerolestes*, which feeds on *Hemiptera*, plant-bugs.

So we see that whilst Ichneumons and Tachinid flies are the best-known and everyday hazards of a caterpillar's existence, there are many other groups of animals which may occasionally attack them.

Fungi and Squirrels.—During August I visited Hardcastle Craggs, with a friend, to seek the clubmoss *Lycopodium clavatum* which occurs there. After searching for some time we gave the task up and walked through a small copse of young silver birch trees. Growing round about was a large number of specimens of *Russula fragilis* Fr. showing small teeth marks on the cap. Then suddenly there was a movement on the ground and not very far in front of us was a Red Squirrel running for the nearest tree with a toadstool between its teeth. In Temple Newsam Woods the Grey Squirrel has stripped the bark completely off a large number of trees. I noted this early in the spring of 1953 and when there again in October there were hundreds of fruiting bodies of *Pleurotus ostreatus* (Jacq.) Fr., the Oyster Mushroom, and various other fungi where the bark had been peeled off.—R. Watling.

FUNGUS FORAY. SANDSEND, 1953

W. G. BRAMLEY

Ichabod ! The glory has departed. The classic grounds of Mulgrave certainly did not live up to their reputation during the autumn Foray of 1953. For several years now agarics have been scarce on our back end forays but this has been the worst of all. After a rather dry winter followed by a summer without any really heavy rain Mulgrave Woods proved very dry and even on the more level and wetter spots the larger toadstools were few and far between. Why this was so can only be guessed at. The slopes were certainly dry but there were patches nearer the stream that were damp enough. The summer has not been hot and this may have had some influence. Parts of the woods show signs of felling at various times and this lack of mature timber no doubt plays a part.

As a contrast it may be worth noting the woods of the Forestry Commission at Dalby near Thornton Dale. Planted about thirty years ago on thin, dry, stony grass, they are made up of conifers of various species. Both in 1952 and 1953 towards the end of October several species of agarics were in profusion. Two or three species of *Tricholoma*, hundreds of *Lactarius deliciosus* and *Boletus piperatus* were to be found, while one roadside was studded with the scarlet caps of *Amanita muscaria*.

Some twenty members attended and the whole of the time was devoted to the Mulgrave area. Special attention was given to agarics and the four young lady beginners were probably thankful that toadstools were not more abundant. We were pleased once again to welcome Miss Wakefield, who gave us much help and contributed all the list of resupinates. To Mr. E. W. Mason and Mr. C. Booth we are indebted for the lists of Fungi Imperfecti and the Pyrenomycetes, specimens of which are now in the Herbarium of the Commonwealth Mycological Institute.

Notes on species collected.

Hypochnella violacea is no doubt rare in Yorkshire, otherwise its colour and purple spores would have been noticed before.

Pluteus patricius is listed by Pearson and Dennis as a variety of *P. cervinus*.

Ascobolus crouani startled its collectors by changing from black to yellowish with the dehiscence of its asci. Unfortunately only a few ascophores were present and the rotten state of the substratum made the finding of them difficult after the foray and no material was preserved.

Bresadolella aurea. This seems to be only the second British collection. Petch (British Hypocreales) makes no mention of the genus.

Protocrea farinosa is also scarce with only two previous collections in the present century. In the field looks like a thin layer of tapioca pudding.

Nigrospora oryzae. This seems to be the first British collection, though apparently quite common in the tropics.

The specific names of the genus *Periconia* are in accordance with the recent monograph by Mason and Ellis (C.M.I.).

Cladosporium macrocarpum is separated from *C. herbarum* on the brown colour of the colonies and the larger spores.

Although a number of species are marked † (not in M. & G.), they have been recorded in recent years.

†=not in Mason & Grainger.
*=not in Mason & Grainger for V.C. 62.
Numbers are accession numbers of C.M.I.
YK.=in Herb. Yorkshire Museum, York.

PHYCOMYCETES

Sporodinia grandis Link, on *Boletus*.

ASCOMYCETES

DISCOMYCETES

Ascobolus atro-fuscus Phill. & Plowr., on burnt wood. Yk.
A. crouani Boud., on wood.
Cyathicula coronata (Bull.) de Not., on herbaceous stems. Yk.
†*Dasyscypha brevipila* Le Gal., on *Ulmus*.
Hyalinia auricolor (Blox.) Boud. (=*inflatula*), on wood.
Otidea onotica (Pers.) Fuckel Yk.
Pustularia ochracea Boud.
Rutstroemia (*Helotium*) *luteo-virescens* (Rob.) White, on *Acer* petioles.

PYRENOMYCETES

†*Bresadolella aurea* v. Höhn, on dead wood. 53996.
†*Camarops tubulina* (A. & S.) Shear, on *Sambucus.* Yk. (=*Nummularia lutea*).
†*Ceratostomella vestita* Sacc., on Juglans. 53939.
†*Chaetosphaeria innumera* (B. & Br.) Tul., on *Ulmus,* 54114; on *Juglans,* 54115.
Eutypella (*Valsa*) *stellulata* (Fr.) Sacc., on *Ulmus.*
†*Gloniopsis levantica* Rehm, on *Ulmus.*
Hypoxylon semi-immersum Nits., on wood.
Leptosphaeria doliolum (Pers.) Ces. & de Not., on *Urtica.*
†*Protocrea farinosa* (B. & Br.) Petch, on *Poria sp.* 53626.

FUNGI IMPERFECTI

MELANCONIALES

†*Colletotrichum dematium* (Pers.) Grove

MONIALES

†*Amblyosporium botrytis* Fres., on *Lactarius sp.* 53561.
**Haplaria grisea* Link, on *Ulmus.*
Acremoniella atra (Corda) Sacc., on *Sambucus.*
†*Acrothecium simplex* B. & Br., on *Urtica.*
†*Cladosporium macrocarpum* Preuss, on *Urtica.* 54101.
†*Nigrospora oryzae* (Berk. & Br.) Petch, on *Bambusa.* 54940.
†*Papularia arundis* (Corda) Fr., on *Bambusa.*
**Periconia byssoides* Pers., on *Urtica.*
†*P. cookei* Mason & M. B. Ellis.
†*P. minutissima* Corda, on *Bambusa.* 54941.
**Stachybotrys dichroa* Grove, on *Heracleum.* 26330.
Torula ovalispora Berk., on *Corylus.*
Bactridium flavum Kunze, on wood.

BASIDIOMYCETES

AGARICALES

Amanita phalloides (Vahl) Fr.
**Collybia ambusta* Fr.
C. tuberosa (Bull.) Fr.
Cortinarius (*Ino*) *albo-violaceus* (Pers.) Fr.
Flammula ochrochlora Fr.
Gomphidius gracilis B. & Br.
Hebeloma longicaudatum (Pers.) Fr.
Inocybe godeyi Gill.
Pluteus patricius (Schulz.) Sacc.
†*P. petasatus* (Fr.) Karst. } on sawdust.
Russula delica Fr.
Tricholoma sulphureum (Bull.) Fr.
Boletus erythropus (Pers.) Quel.

APHYLLOPHORALES

Polyporus dryadeus (Pers.) Fr.
Poria obducens (Pers.) Quel.
Daedalea biennis (Bull.) Quel. (=*Polyporus rufus*).
Trametes gibbosa (Pers.) Fr.
Corticium lactescens Berk. (abundant).
Exidia nucleata (Schwein.) Rea
**Hypochnella violacea* (Awd.) Schroet.
Odontia arguta (Fr.) Quel.
Peniophora longispora (Pat.) v. Höhn. & Litsch.
P. quercina (Pers.) Cooke.
Radulum orbiculare Fr.
†*Solenia candida* (Hoffm.) Fr.
Tomentella pallido-fulva (Peck) Litsch.
(According to Donk=*T. ferruginea* Auct. non Pers.)

THE ENTOMOLOGY OF SPURN PENINSULA

(*Concluded from page* 78)

XV. ADDITIONS, CORRECTIONS AND CONCLUSIONS

The present series of visits to Spurn by the Section having terminated it is intended in this concluding part to bring our report down to July 1953. The following additions are necessary therefore to the ' Introduction ' (*The Naturalist*, 1951, 75).

Dates of Visits. (5) June 15th to June 25th, 1951.
(6) July 11th to July 21st, 1952.
(7) July 17th to July 27th, 1953.

Personnel. The following are the names of members of our parties, additional to those listed on p. 75 (1951).

L. Bilton
Colonel G. Brownlow
J. H. Flint (J.H.F.)
O. Gilbert (O.G.)
H. Henson (H.H.)
K. G. Payne (K.G.P.)
E. J. Popham (E.J.P.)
H. M. Russell (H.M.R.)
B. B. Snell
G. E. Woodroffe (G.E.W.).

Collecting. Collecting from 1951 to 1953 followed much the same lines as already indicated (1951 : 76) with the small extensions referred to in the following section ' Areas Studied '. In one important direction, however, the work was specially modified. In 1952 Dr. Popham made a series of observations on the salinities of the dykes and ponds and on the associated fauna. The floods of January 31st to February 1st, 1953, wrought considerable changes in many Spurn habitats, especially the aquatic ones, so that Dr. Butler concentrated on repeating Popham's observations in 1953, with some help from other members of the party. A joint paper by Butler and Popham, which will be published elsewhere, contains a detailed account of their observations but they have been kind enough to provide a brief summary for this report (pp. 104-107).

When collecting over the non-aquatic habitats in 1953 a number of differences in the fauna were noted as compared with previous years and brief notes on this topic are included below.

Mr. Woodroffe joined the 1953 party and collected Heteroptera with particular reference to their food-plants. His report adds further information as well as some new species to the earlier brief report on the suborder and therefore is included here in full (pp. 96-98).

Areas Studied. These have been referred to in earlier parts of this report but some additional information now becomes necessary.

Pond in Phragmites Area (P.P.A.) It is necessary to point out that the pond referred to under this name is actually a bomb-crater just beyond the northern extremity of the Phragmites Area. When this pond was first examined in 1947 it was not realised that there was another pond in the middle of the Phragmites Area. The latter was dry in 1947 but contained water on subsequent visits and was later examined. It was called the ' Island Pond ' (I.P.) because it formed a circle or moat around a central island.

Warren. The re-erection of some houses, with gardens, and other buildings for military purposes on the Warren has destroyed some of the habitats which were worked during earlier visits. The correction of an error may be mentioned here which affects several parts of the report: the umbelliferous plant on the Warren reported as Wild Celery (p. 81 *et seq.*) is in fact Parsley (*Petroselinum sativum* Hoffm.).

Pond near Boundary Dyke (P.B.D.). A cattle pond in the Marsh Meadow near the junction of Boundary Dyke and the Kilnsea-Spurn road. It was examined in 1947 but was then overlooked until 1952 and 1953.

Walker Butts Bank Dyke. It is with regret that we report that owing to the floods of early 1953 it became necessary to enlarge this dyke. At the close of our 1953 visit the dyke and part of the adjoining Marsh Meadow was being ' bulldozed ' in order to increase the height of the bank. This involved the destruction of the old dyke and we understood that a new one was to be constructed some ten yards farther inland.

Foreshore. It may be useful to note here the great increase in *Spartina townsendii* which we witnessed during the seven years we visited Spurn. In 1947 only a few isolated tufts were seen but by 1953 large and more numerous tussocks gave an impression of an almost continuous green belt when seen from the tops of the dunes. At this rate of progress, if unchecked, the grass will produce very marked changes in the ecological conditions and fauna of the Humber estuary.

Long Bank Dyke. See map on p. 77. This dyke marks the Easington-Kilnsea parish boundaries and extends from the Humber to near the North Sea coast. The dyke is large and deep with high banks and provided interesting collections of aquatic as well as land insects.

Kilnsea Saltings. This interesting area was only visited after the first parts of this report were published. Although beyond the original limits of our area it was visited on several occasions and records have been included in the reports. It is reached from Kilnsea village by a lane running north (Lane to Saltings or North Lane) between thorn hedges which afford protection to the insects visiting the rich flora of its verges. About half a mile from the village the hedges disappear and the lane, now near the beach, is lost in dunes and a patch of *Phragmites* before entering a large flat meadow containing much *Juncus gerardi* and salt-marsh plants, with a central area of mud which is under water in winter. North of this meadow is the south-east bank of Long Bank Dyke with a series of saltings running parallel with it as far as the sea. These are inundated in winter and at high tides but were often almost dry during our visits. Many interesting insects were found in the lane, meadow and saltings, a number of which were discovered subsequently within the Spurn area.

South Lane. The portion of the Kilnsea-Spurn road from the level of Boundary Dyke to the Pond in Marsh Meadow was not collected over until 1953 when it proved to be similar to the North Lane already referred to. A sheltering hedge on the west separates the lane from the Marsh Meadow and many insects from the latter area find protection from the wind in the rich vegetation of the verge.

Welwick Salt Marsh. Three visits were paid to the well-known salt marshes at Welwick, some miles inland along the Humber estuary, in order to compare the fauna with that of the salt marsh at Spurn and the Kilnsea saltings. Welwick has considerable stretches of true salt-marsh, inundated with each tide. The flora shows a succession from *Spartina* and *Salicornia* to *Limonium, Aster* and *Armeria.* A few records of species taken here have been included in the reports.

In the following reports the signs used are as follows:

‡ New to Britain. † New to Yorkshire.
* New to V.C. 61. § Included in earlier reports.
|| New to Spurn area.

In general species included in the present supplementary reports are restricted the above classes. To include additions to the lists for the sub-areas would involve too much space.

HEMIPTERA-HETEROPTERA AT SPURN, JULY 24TH-26TH, 1953

G. E. WOODROFFE

CYDNIDAE

†*Legnotus picipes* (Fall.)—One on *Galium.** near SM.

COREIDAE

§*Myrmys miriformis* (Fall.)—Common in grassy areas. W. MH. MS. [near Kilnsea saltings].

NEIDIDAE

§*Berytinus signoreti* (Fieb.)—One adult and many nymphs under *Lotus corniculatus.** W.

§*Gampsocoris punctipes* (Germar)—Nymphs and adults very abundant under *Ononis.** W. MH. MS. PH.

LYGAEIDAE

Nysius thymi Wolff.—Many nymphs and a few adults in dry, moss-covered areas. W. near SM.

§*Taphropeltus contractus* (H.-S.)—One specimen in company with *N. thymi*.

TINGITIDAE

§*Tingis ampliata* (H.-S.)—One adult on the ground. W.

§*T. cardui* (L.)—Nymphs locally abundant on thistles. W. MH. near SM.

NABIDAE

§*Nabis flavomarginatus* Scholtz.—Very abudant under *Phragmites, Juncus,* etc. PH. SM.

§*Nabis major* (Costa)—Generally distributed, but extremely abundant (nymphs and adults) under *Ammophila*. W. MH. MS.

ANTHOCORIDAE

§*Anthocoris nemoralis* (Fab.)—In some numbers on *Hippophaë rhamnoides*. W. MH. MS.

Lyctocoris campestris (Fab.)—Beaten in some numbers from *Ulex*—a most unusual habitat for this species. W.

MICROPHYSIDAE

Loricula elegantulus (Baerens.)—One brachypterous female beaten from *Crataegus*. [Lane leading to Kilnsea Saltings.]

MIRIDAE

§*Pithanus maerkeli* H.-S.—Very common in grassy areas and especially in *Juncus*. W. PH.

Phytocoris ulmi (L.)—Nymphs only beaten from *Crataegus*.* [Lane leading to Kilnsea Saltings.]

§*Adelphocoris lineolatus* (Goeze)—Very common on *Ononis*.* W. MH. MS. PH.

§*Calocoris norvegicus* (Gmel.)—Common and generally distributed. W. MH. MS. PH.

Stenotus binotatus (Fab.)—Common in grassy areas. W.

Lygus kalmi (L.)—Several on *Umbelliferae*. MH. near SM.

Polymerus nigritus (Fall.)—One nymph under *Galium*.* W.

§*Liocoris tripustulatus* (Fab.)—Several on *Urtica*.* W.

§*Stenodema laevigatum* (L.)—Occasional on various grasses. W. MH. MS.

Notostira erratica (L.)—Common by sweeping grasses. W. MH. MS.

Trigonotylus ruficornis (Geoff.)—In some numbers on grasses in damp areas. PH. [Kilnsea Saltings.]

Teratocoris saundersi D. & S.—On *Juncus** locally fairly common. PH. [Kilnsea Saltings.]

Leptopterna dolabrata (L.)—A few, on grasses. W. [Lane leading to Kilnsea Saltings.]

§*L. ferrugata* (Fall.)—Abundant on grasses in dry areas. W. MH. MS.

Globiceps dispar (Boh.)—Locally common in a few patches of *Ononis** growing in long grass. W. PH.

†*Orthotylus rubidus* var. *moncreaffi* (D. & S.)—A few, by sweeping. *Atriplex** and *Suaeda*. SM.

Capsus meriopterus (Scop.)—Common on *Crataegus** and by sweeping *Urtica*, etc. W. [Lane leading to Kilnsea Saltings.]

Orthocephalus saltator (Hahn)—Nymphs and adults under *Hieracium*.* W.

§*Macrotylus paykulli* (Fall.)—Very abundant under *Ononis*.* W. MH. MS. PH.

Plagiognathus chrysanthemi (Wolff)—Locally abundant on low plants, especially *Galium*.* W. MH. MS.

P. arbustorum (Fab.)—A few by sweeping *Urtica* and other rank vegetation. W. [Lane leading to Kilnsea Saltings.]

P. albipennis (Fall.)—In some numbers on *Artemisia maritima*.* F.

SALDIDAE

**Salda littoralis* (L.)—A few among *Atriplex* and *Suaeda*. SM. [Kilnsea Saltings.]
Saldula saltatoria (L.)—Nymphs and adults on mud and among salt-marsh plants. SM.
S. pilosella (Thomson)—One specimen in company with *S. pallipes*. D.
§*S. pallipes* (Fab.)—Common on mud in dyke. D. [Kilnsea Saltings.]
Chartoscirta cincta (H.-S.)—One adult and several nymphs under *Phragmites* and *Juncus*. PH.

* An important food-plant of the species.

LEPIDOPTERA

H. N. MICHAELIS

The following list contains species additional to that published in *The Naturalist* (1951: 183-190; 1952: 131). The additional periods spent at Spurn were July 14th to 19th, 1952, and July 17th to 25th, 1953. The weather in both periods was on the whole unfavourable owing to strong winds and, in 1952, to cool conditions. Smoke was used persistently to drive the moths from their hiding places during the day time and this method proved very profitable. In 1953 a M.V. lamp was used near the cottage with varying results. The strong westerly winds prevented a true assessment of the number of species, for many insects, especially the smaller species, did not fly at night under such conditions. We did have one warm, still period of two hours when it was impossible to deal with the large number of insects attracted to the lamp. There were no blank nights and the use of the M.V. lamp enabled me to add a number of common species to the list together with a few interesting 'microlepidoptera'. One day in July, 1953, was used exclusively for searching the four main types of bush which grow on the northern end of Kilnsea Warren. These are rose, hawthorn, blackberry and willow.

My thanks are due to Mr. Bradley of the British Museum for identifying some of the more difficult species. Without his kind help several species could not have been included in the list.

Abbreviations

In addition to abbreviations previously used is: 'Road to Stgs.'—the rough road from the cafe to the Salt Marsh at the North Sea end of Long Bank Dyke. 'Saltings' is used to describe this area while 'Saltmarsh' refers to the marsh near the Lighthouse.

Species marked § are also shown in the previous list.

CARADRINOIDEA

ARCTIIDAE

Comacla senex (Hübn.)—KW., North Sea Dunes and MR. 7/52-3.

NOLIDAE

Nola cucullatella (L.)—KW. [Road to Stgs.]. Common.

CARADRINIDAE

Coenobia rufa (Haw.)—KW. One at MVL., 7/53.
Caradrina taraxaci (Hübn.)—KW. Several, 7/53.
Petilampa minima (Haw.) (*arcuosa* (Haw.))—KW. and MM., plentiful.
Euplexia lucipara (L.)—KW. Two at MVL, 7/53. A surprising record considering the absence of bracken and ferns.
Apamea unanimis (Hübn.)—KW. One in spider's web.
Peridroma saucia (Hübn.)—KW. There was a migration observed from July 15th-19th, 1952—the date of our leaving. The moths had a habit of settling on the wire netting of the bird trap on the southern side after dark. The numbers increased from six on 15/7/52 to 35 on 19/7/52. None were seen in 1953.
Amathes c-nigrum (L.)—KW. Two, 7/52; five, 7/53.
Diarsia festiva (Schiff.)—KW. Two at MVL., 7/53.
Axylia putris (L.)—KW., Common, 1953.
Cirrhia fulvago (L.)—MM. One, 7/53.

§*Cucullia asteris* (Schiff.)—Larvae plentiful on *Aster tripolium* throughout the area, 7/53.
Leucania conigera (Schiff.)—KW. Five in 7/52-53.
Orthosia gracilis (Schiff.)—MM. Larva on *Spirea* 1952. Bred., 1953.
Hadena serena (Schiff.)—KW. One, 1953.

PLUSIIDAE
Hypena proboscidalis (L.)—KW., and MR., also near Salt Marsh.
Plusia chrysitis (L.)—KW. Commonn, at MVL., 7/53.

NOTODONTIDEA

STERRHIDAE
§*Sterrha fuscovenosa* (Hübn.)—Plentiful throughout the area with the exception of the Marsh Meadow.
§*Scopula imitaria* (Hübn.)—KW. Several at MVL. 7/52.

HYDRIOMENIDAE
Eupithecia extensaria Frey.—KW., 7/48 (W.D.H.); larvae in 1950 at Kilnsea (S.M.J.)
Lygris dotata (L.)—KW. Common, at MVL., 7/53.
Cidaria fulvata (Forst.)—Road to Stgs., 7/52.
Earophila badiata (Schiff.)—KW. Larvae in 1952. Bred 1953.

SELIDOSEMIDAE
Ourapteryx sambucaria (L.)—KW. Common, at MVL., 7/53. Possibly imported with Privet for the bird trap.
Gonodontis bidentata (Clerck)—Kilnsea, 6/50.

NOTODONTIDAE
Phalera bucephala (L.)—KW. Two at MVL., 7/53.

PAPILIONOIDEA

SATYRIDAE
§*Maniola tithonus* (L.)—[Plentiful on Road to Stgs.]
Aphantopus hyperantus (L.)—Plentiful at western end of area.

HESPERIIDAE
Augiades sylvanus (Esp.)—KW. [Road to Stgs., 1953.] Occasional.

PYRALOIDEA

PHYCITIDAE
Ephestia elutella (Hübn.)—Two in cottage.
Homoeosoma sinuella (Fabr.)—KW., one, 7/53.
H. saxicola Vaughan—KW. Several at MVL, 1953.

PYRAUSTIDAE
Nymphula stratiotata (L.)—KW. One at MVL.
Aphomia sociella (L.)—KW. One, 1952. Larva feeds in nests of bees.
Notarcha ruralis (Scop)—KW. and MR., also near Salt Marsh.
Phlyctaenia crocealis (Hübn.)—KW. One, 1952; [Road to Stgs, common 7/53 among *Inula*.]
Pyrausta cespitalis (Schiff.)—KW. One, 7/52.
Scoparia frequentella (Staint)—KW. [Road to Stgs.]
S. pallida (Steph.)—MM. Three specimenss, 1952-3.

PYRALIDIDAE
Hipsopygia glaucinalis (L.)—In cottage, 1952.
Aglossa pinguinalis (L.)—In cottage, 1949, 52, 53.

ALUCITIDAE
Pterophorus lithodactylus (Treits)—KW. [Road to Stgs.] Occasional among *Inula*.

LASIOCAMPOIDEA

LASIOCAMPIDAE

Malacosoma neustria (L.)—KW. One at MVL., 7/53.
Lasiocampa quercus (L.)—KW. One, 7/53.

TORTRICOIDEA

PHALONIIDAE

Lozopera francillana (Fabr.)—KW. Four on one night at MVL.
Phalonia affinitana (Doug.)—WBBD. One, 1952. [Saltings, three, 7/53.]
§*P. vectisana* (Westw.)—[Plentiful in Long Bank Dyke and on the Saltings.]

TORTRICIDAE

Pandemis cerasana (Hübn.) (*ribeana* (Hübn.))—KW. [Road to Stgs.]
Tortrix viridana (L.)—A most remarkable occurrence as no oak is to be found in the vicinity. A live moth was found by Dr. Butler on a clump of *Spartina townsendii* in the Humber mud at low tide. Presumably it was carried by wind or a passing ship.
T. consimilana (Hübn.) (*unifasciana* Dup.)—Common, among Privet in the bird trap. Probably imported with food.
Peronea emargana (Fabr.) (*caudana* (Fabr.))—KW. One bred from *Salix*.
P. rhombana (Schiff.) (*contaminana* (Hübn.))—Common, on Hawthorn on KW.

EUCOSMIDAE

§*Spilonota ocellana* (Schiff.)—Abundant throughout on *Hippophaë rhamnoides* and Hawthorn.
Gypsonoma sociana (Haw.) (*dealbana* (Fröl.))—[Road to Stgs.]
Notocelia rosaecolana Doub.—KW. [Road to Stgs.]
N. suffusana (Dup.) (*trimaculana* (Haw.))—KW. 1952-3.
Eucosma citrana (Hübn.)—KW. One at MVL., 7/53.
§*E. aemulana* (Schläg.)—Salt Marsh near the Point.
E. cana (Haw.)—KW. 1952-53.
E. cirsiana (Zell.)—KW. [Road to Stgs., 1953.]
E. cynosbatella (L.)—[Road to Stgs.]
E. penkleriana (F. v. R.)—[Road to Stgs. Occasional.]
Bactra robustana Christoph—By pond on KW. One, 7/53.
Argyroploce nubiferana (Haw.) (*variegana* (Hübn.))—Cn., among Hawthorn.
A. rufana (Scop.)—KW. Two, 7/53.
Hemimene plumbagana (Treits.)—KW. Two, 7/52.
Pammene regiana (Zell.)—KW. Several in 1952-53. Introduced with Sycamore in the bird trap.

TINAEOIDEA

GELECHIIDAE

Telphusa vulgella (Hübn.)—KW. Two from Hawthorn.
Bryotropha basaltinella (Zell.)—A few among dunes on KW. and MR.
Bryotropha affinis (Doug.)—KW. and MR.
B. mundella (Doug.)—KW. and MR. Common.
B. senectella (Zell.)—Common among dunes throughout.
Gelechia fumatella Douglas, KW. 5 specimens in 1952/53.
Phthorimaea maculea (Haw.)—[Road to Stgs. Two, 7/52.]
P. plantaginella (Staint.)—WBBD. Two, 7/52.
P. seminella Pierce and Metcalfe. WBBD, SM, common.

COSMOPTERIGIDAE

Mompha raschkiella (Zell.)—KW. Two bred from *Epilobium*.
Blastodacna hellerella (Dup.)—KW. Several from Hawthorn.

OECOPHORIDAE

Depressaria propinquella (Treits.)—KW. Two, 8/49.
D. carduella (Hübn.)—KW. One, 8/49.
D. cnicella (Treits.)—MR. Larvae on *Eryngium maritimum* by B. B. Snell, 7/53.

ELACHISTIDAE

Elachista scirpi Staint.—WBBD. One each in 7/52-53. The apparent scarcity of the two species feeding on *Scirpus maritimus*, namely *E. scirpi* and *B. robustana*, is surprising. The plant is well established in the pond on KW., in WBBD. and [near Long Bank Dyke].

E. cerusella (Hübn.)—[Road to Stgs. Occasional.]

E. obscurella Staint.—KW. Bred, 1950.

E. dispunctella (Dup.). KW. 1 specimen, 1952.

YPONOMEUTIDAE

Swammerdamia spiniella (Hübn.) (*caesiella* (Hübn.))—KW. On Hawthorn.

COLEOPHORIDAE

Coleophora therinella Tengst.—KW. and MR. Possibly common, on Thistle.

C. nigricella (Steph.)—KW. Common, on Hawthorn.

C. obtusella Staint.—WBBD. Among *Juncus maritimus*, 7/53.

(Two species of *Coleophora*, as yet unidentified, were taken.)

GRACILLARIIDAE

Lithocolletis oxyacanthae (Frey.)—Common, on Hawthorn.

L. corylifoliella (Haw.)—The distinctive upperside mine was found occasionally on Hawthorn on KW.

Ornix anglicella (Staint.)—Several on Hawthorn, 7/50, on KW.

LYONETIIDAE

Leucoptera scitella (Zell.)—KW. Among Hawthorn.

Lyonetia clerkella (L.)—KW. Two bred from Hawthorn near Cottage.

Tischeria marginea (Haw.)—KW. [Road to Stgs. Bred 1953.]

TINAEIDAE

Tinaea semifulvella Haw.—Two in bird trap near Salt Marsh.

STIGMELLIDAE

Stigmella oxyacanthella (Staint.)—KW. Bred from Hawthorn, 1953.

S. aurella (Staint.)—KW. Two, 7/53.

HOMONEURA

HEPIALIDAE

Hepialus sylvinus (L.)—KW. Several at MVL., 7/53.

CONCLUSIONS

CONCLUSIONS

As this is the last visit of the Y.N.U. Entomological Section for the purpose of the present survey, it seems desirable to add a few notes as to the conclusions reached regarding the Lepidoptera. In the short time available for collecting during the years 1947-53 the area has produced 365 species, including a few taken on the Long Bank Dyke Saltings and the rough farm road leading thereto. Little collecting has been done in May and June and none in the autumn. From appraisal of the area it is maintained that many species could be added to the list.

A rough attempt is given below to analyse the species taken to date. It is not easy to allot some species to the arbitrary categories used and the resulting percentages can only give a general indication.

(1) Coastal, Salt Marsh and Maritime species 12%

(2) Species feeding on reeds and aquatic plants in the ponds excluding those feeding on maritime pabulums included in No. 1 ... 2%

(3) Species feeding on grasses excluding those included in No. 1 ... 14%

(4) Species feeding on bushes and shrubs, namely, hawthorn, rose, blackberry, salix, etc., but not upon *Hippothoë rhamnoides*. These include a few species on privet, sycamore and *Prunus* which may have been introduced with the food 15.5%

(5) Species feeding on plants not included in Nos. 1-4. These include a common roadside, meadow, marsh and garden plants which do not require maritime conditions in which to thrive 49%

(6) Species which are generally accepted as migrants ... ... 3·5%
(7) Species feeding on stored products, decayed wood, hay, wool, in birds' nests or attached to nests of bees and wasps 4%

Species taken to date appear to be reasonably suited to the ground with the exception of *Tortrix viridana* (L.) previously mentioned and *Diacrisia sannio* (L.) taken by the late Robert Proctor in June 1947.

The area was flooded by the high tides of January 1953, and the configuration of the dunes on the North Sea Coast was greatly changed, resulting in the loss of numbers of plants on which larvae fed. A week in July was much too short to assess any major changes in the status of species of Lepidoptera but a few observations were made.

(1) The increased salinity of the soil on the Warren and Humber shore area adjoining the Walker Butts Bank Dyke encouraged the growth of *Aster* and *Triglochin*. Larvae of *Cucullia asteris* and *Bucculatrix maritima* (Staint) on *Aster* and the moth *Phalonia vectisana* Westw., among *Triglochin* were more plentiful than in 1949 and 1952.
(2) *Sterrha emutaria* (Hübn.) which was plentiful in July 1952, on the part of the Warren flooded in January 1953, was absent from this area in July 1953, while the numbers of *Sterrha fuscovenosa* (Goeze) were not affected.
(3) The salt has dwarfed the growth of *Senecio jacobaea* while *S. erucifolius* was more plentiful and stronger in growth than in the previous year. The larvae of *Hypocrita jacobaeae* (L.) was plentiful on both plants in 1953 while, in 1949 and 1952 they were found principally on *S. jacobaea*.
(4) *Crambus perlellus* (Scop.) and *C. culmellus* (L.), whose larvae feed at the roots of grass, were not affected by immersion in salt water in the Marsh Meadow. *C. culmellus* was as plentiful as usual and rather more *C. perlellus* were seen than in previous years.
(5) It appears that the increased salinity of the ponds on the Warren, etc., has had no deleterious effect on species associated with pond vegetation. Two species previously taken appeared again in 1953, namely *Cataclysta lemnata* (L.) (two) and *Hydrocampa nymphaeata* (L.) (four). Another species, *Nymphula stratiotata* (L.) (two) appeared for the first time in 1953. These species feed on aquatic plants, such as *Lemna*, *Sparganium*, *Elodea*, *Potamageton*, *Hydrocharis*, etc.

OTHER ORDERS, ADDITIONS AND CORRECTIONS

W. D. HINCKS AND S. SHAW

ORTHOPTERA

‖*Conocephalus dorsalis* (Latreille) D., nymphs, 7/52, 7/53.
§*Roeseliana roeselii* (Hagenbach)—[North Lane, 7/52, 7/53, last instar nymphs.]

ODONATA

Enallagma cyathigerum (Charpentier)—[LBD., 7/52 (J.H.F.)]
Coenagrion puellum (L.)—PMM., 7/52, nymphs (E.J.P.) [LBD., 7/52 (J.H.F., E.J.P.)]
Aeshna cyanea (Mueller)—PPA., 7/52 (E.J.P.).
Libellula quadrimaculata L.—PPA., 7/52 (E.J.P.); BD., 7/52, one nymph (J.H.F.).
Sympetrum fonscolombii (Selys)—[Saltings, 1 ♂, 7/52 (J.H.F.)].
S. sanguineum (Mueller)—[LBD., 7/52! (J.H.F.)].

NEUROPTERA

Sisyra fuscata (Fabricius)—W., at light, 20/7/52 (W.D.H.).
Kimminsia betulina (Stroem)—W., at light, 20/7/52 (W.D.H.).

MECOPTERA

Panorpa communis L.—[LBD., 23/7/53, ♂♀].

HEMIPTERA

Dictyonota tricornis (Schrank)—[Saltings, 7/52 (J.H.F.)].
Nabis lineatus Dahlbom—[Saltings, 7/52 (J.H.F.)].
Anthocoris nemorum (L.)—Sea cliffs, 7/52 (J.H.F.).
Calocoris ochromelas (Gmelin)—W.! PH.!, 7/52 (J.H.F.).

Lygus viridis (Fallén)—W. 7/52 (J.H.F.).
L. pratensis (L.)—W. 7/52 (J.H.F.).
Hydrometra stagnorum (L.)—[LBD., 7/52 (E.J.P.)].
Microvelia reticulata (Burmeister)—[LBD., 7/52 (E.J.P.)].
Velia caprai Tam.—BD., 7/52 (E.J.P.).
Notonecta viridis Delcourt—Crater MM.!, 6/51, 7/52; PPA., IP., 7/52 [LBD., 7/52].
‖*Corixa falleni* (Fieber)—PPA., 7/52 (J.H.F.).
C. punctata (Illiger)—PBD.; PPA.; IP., 7/52 [LBD., 7/52] (E.J.P.).
C. sahlbergi (Fieber)—IP., 7/52 [LBD., 7/52] (E.J.P.).
C. praeusta (Fieber)—PPA., 7/52 [LBD., 7/52] (E.J.P.).
C. fossarum Leach—PMM.; crater, MM., 7/52 (E.J.P.).
C. venusta (Douglas & Scott)—PPA., 7/52 (E.J.P.).
C. limitata (Fieber)—PPA., 7/52 (E.J.P.).
Neophilaenus lineatus (L.)—W.!; sea cliffs!; MR.! 7/52 (J.H.F.).
Cicadella abrotani (Douglas)—Near F., on *Artemisia*, 7/52 (J.H.F.).
Araeopus pulchellus (Curtis)—MR.!; sea cliffs!, 7/52 (J.H.F.).
Lepidosaphes ulmi (L.)—Abundant every year on the White-beam in the cottage garden.

COLEOPTERA

Notiophilus substriatus Waterhouse—W., 7/52 1 specimen (J.H.F.).
Stomis pumicatus (Panzer)—[LBD., 16/7/52 (S.S.)].
Haliplus wehnckei Gerhardt—[LBD., 7/52 (E.J.P.)] (det. E. J. Pearce as probably this species).
H. apicalis Thomson—[LBD., 7/52 (E.J.P.)] (det. E. J. Pearce).
Laccophilus variegatus (Germar) (*The Naturalist*, 1952: 133)—Should be deleted and the records transferred to *L. minutus* (L.).
§*Hydroporus tessellatus* Drapiez—[Lane to Stgs., in cart rut, 24/7/53 (P.M.B.)]. Previously a single specimen, taken in D. (*The Naturalist*, 1952: 133).
Agabus nebulosus (Forster)—Crater, MM., 7/52 (E.J.P.).
Ilybius ater (Degeer)—PMM., 7/52 (E.J.P.).
Ochthebius minimus (Fabricius)—IP., 7/52 (E.J.P.).
Necrophorus humator (Goeze)—W., at light, 19/7/53.
N. investigator Zetterstedt—PH., 16/7/52; W., at light, 20/7/53.
Agathidium marginatum Sturm.—MF., 14/7/52 (S.S.); sea cliffs, 7/52 (J.H.F.).
Calyptomerus dubius (Marsham) MM, in straw refuse, 9/8/50 (W.O.S.).
Euplectus sanguineus (Denny) PA, in straw heap, 1 specimen, 23/7/48 (W.O.S.).
Rybaxis longicornis (Leach) PA, reed debris, 1 specimen, 23/7/48 (W.O.S.).
Mycetoporus punctus (Gyll.)—To replace *M. lepidus*, *The Naturalist*, 1953: 126.
Malthodes minimus (L.)—W., 12/7/52.
Athous bicolor (Goeze)—South Lane, 24/7/53 [North Lane, 17-18/7/52].
Adrastus nitidulus (Marsham)—W., 12/7/52.
Kateretes rufilabris Latreille—[LBD., 23/7/53].
Epurea deleta Sturm—Spurn, 16/7/52 (T.B.K.).
Micrambe vini (Panzer)—W., 7/53, on wing near cottage (det. G.E.W.).
M. abietis (Paykull)—W., 7/53, on wing near cottage (det. G.E.W.).
‡*M. lindbergorum* Bruce—W., 15/8/49, 7/53, two specimens of this new British species (det. G.E.W.). It will be brought forward in a forthcoming paper by Mr. Woodroffe.
Anatis ocellata (L.)—[North Lane, 17/7/52].
Salpingus ater (Gyllenhal)—Sea cliffs, 13/7/52, 1 specimen, dead when found (W.D.H.).
Serica brunnea (L.)—F., 26/7/53, 1 dead specimen.
Bruchus loti Paykull —[North Lane, 24-25/7/53 (W.D.H.)].
Apion aethiops Herbst—W., 7/52 (J.H.F.).
Otiorrhynchus rugifrons (Gyllenhal)—MM., 16/7/52.
Phytonomus fuscocinereus (Marsham)—[North Lane, 17-18/7/52 (W.D.H.)].

HYMENOPTERA

Allantus (*Emphytus*) *calceatus* (Klug)—South Lane, 22, 25/7/53.
‖*Selandria serva* (Fabricius)—South Lane, 22/7/53, 1♀.
‖*Pachynematus truncatus* Benson—South Lane, 22/7/53, 1♂.

Pontania proxima (Lepeletier)—South Lane, galls on *Salix* sp., 7/53.
||*Microctonus aethiops* (Nees)—South Lane, 21/7/53 [North Lane, 25/7/53].
†*Alysia rufidens* Nees—MM., 19/7/53, 1♀ (W.D.H.).
Coelinidea nigra (Nees)—PH., 21/6/51; MR., 23/6/51; sea cliffs, 7/52; SM., 7/52; W., 7/52, 7/53; MR., buckthorn, near SM., 23/7/53; South Lane, 22/7/53 [North Lane, 7/52, 7/53].
Hemiteles bicolorinus Gravenhorst—[North Lane, 25/7/53, 1♀ (W.D.H.).]
Enicospilus merdarius (Gravenhorst)—W., at light, 20, 23/7/53.
**Anacharis eucharioides* (Dalman)—W., 26/7/53, ♂♀ (S.S.).
†*Xylaspis armata* (Giraud)—South Lane, 21/7/53 (S.S.).
†*Litomastix phalaenarum* Thomson—[North Lane, 24-25/7/53!].
L. sp. near *aestivalis* Mercet.—This species was extremely abundant in 7/53 in the North and South Lanes. A few specimens also occurred in W., PH., and LBD.
||*Choreia inepta* (Dalman)—South Lane, 21/7/53.
**Aphelinus abdominalis* (Nees)—[North Lane, 25/7/53, 1♀ (S.S.)].
†*A. tibialis* (Nees)—SM., 18/6/47; South Lane, 21/7/53 [North Lane, 24/7/53].
‡*Anaphes* (*Patasson*) *brachygaster* Debauche—[North Lane, 24/7/53, 2♂ 1♀; LBD., 23/7/53, 1♀ (W.D.H.)].
†*Enaesius agilis* Enoch—W., 19/7/53, 1♀ (W.D.H.).
**Ooctonus vulgatus* Haliday—W., 26/7/53; South Lane, 22/7/53; Railway lines near PH., 22/7/53 [North Lane, 24/7/53; LBD., 23/7/53]. Males were fairly common but only a single ♀ was taken.
||*Paracodrus apterogynus* (Haliday)—South Lane, 22/7/53 (S.S.).
Hedychridium roseum (Rossi) (*The Naturalist*, 1953: 140)—For this read *H. ardens* (Latreille).
Spilomena troglodytes (van der Linden)—W., 19/7/53, 3 specimens. (W.D.H.).
||*Epeolus variegatus* (L.)—South Lane, 24/7/53 (S.S.).

DIPTERA

Odontomyia viridula (Fabricius)—[LBD., 23/7/53, 1♀ (W.D.H.)].
Oxycera trilineata (Fabricius)—W., 12/7/52 (S.S.).
Lonchoptera furcata (Fallén)—W., at light, 19/7/53 (W.D.H.).
Sepsis fulgens Meigen—MR., buckthorn, near SM., 26/7/53 (W.D.H.) (det. L. N. Kidd).
Borborus ater Meigen—MR., buckthorn, near SM., 26/7/53 (W.D.H.) (det. L.N.K.).

THE INSECT FAUNA OF THE PONDS AND DYKES OF SPURN FOLLOWING THE FLOODING OF 1953

P. M. BUTLER AND E. J. POPHAM

INTRODUCTION

The fauna of the fresh- and brackish-water habitats of Spurn had been thoroughly investigated in connection with the survey carried out by the Entomological Section of the Yorkshire Naturalists' Union before the area was inundated by sea water on the night of January 31st-February 1st, 1953. This caused very considerable damage in the fauna due mainly to the fact that the ponds and dykes were filled with salt water. When the Section visited the area in July 1953 it was decided to make a careful re-examination of the aquatic habitats. In each habitat the salinity was measured and the insects and other aquatic animals present were recorded. It is hoped to publish the full results of this investigation at a later date, but in the meantime it was felt that an interim report on the species found in 1953 would be of interest to those who may have the opportunity of visiting the area in 1954.

METHOD OF MEASURING SALINITY

The salinities of the habitats were measured in the field by titrating a known volume of water against a standard solution of silver nitrate. This solution was made up so that 10 c.c.s were equivalent to 1 c.c. of sea water. One c.c. of water from a given habitat was measured by means of a small pipette and placed in a clean tube or bottle. A few drops of a solution of potassium dichromate were then added as an indicator. The standard solution of silver nitrate was then run in from a graduated pipette holding 10 c.c.s until a faint brick red colouration persisted after shaking. From the results so obtained the percentage of sea water was calculated. This method is accurate to about 2½%.

SALINITY OF THE PONDS AND DYKES

The investigation of 1953 showed that the water in most of the ponds and dykes was still very salt even five months after the flood. The salinity differed considerably from one habitat to another, depending upon the amount of drainage, and in some cases on whether the water in the pond had been pumped out after the flood. The salinities of the main habitats (expressed as percentage of sea water) were as follows, with the salinity in July 1952 in brackets.

Pond in Marsh Meadow (PMM.)	20	(3)
Land Mine Crater in Marsh Meadow (LMC.) (=Crater MM.)	73	(4)
Pond near Boundary Dyke (PBD.)	40	(5)
Long Bank Dyke (LBD.)	24	(5)
Bomb Crater in Phragmites Area (BCP.) (=PPA.) ...	60	(10)
Island Pond in Phragmites Area (IP.)	43	(14)
Boundary Dyke (i) Eastern end (BDE.)	7-15	(5-11)
(ii) Western end (BDW.)	26	(40-100)
Walker Butts Bank Dyke (WBB.)	55-63	(81)
New Ponds near WBB.	28 and 40	—

It will be seen that there has been a general increase in salinity except Walker Butts Bank Dyke and Boundary Dyke West, which were always very saline before the floods occurred.

CHANGES IN THE INSECT FAUNA

Ephemeroptera. The only mayfly before the flood was *Chloeon dipterum* and this had disappeared in 1953.

Odonata. *Ischnura elegans*. Adults common in 1953 ovipositing in quite saline water. Nymphs were found in three ponds in a maximum salinity of 73%.
Lestes sponsa (PMM.), *Sympetrum striolatum* (PMM.) and *Pyrrhosoma nymphula* (LBD.) nymphs were found in one habitat each. *Sympetrum striolatum* nymphs had occurred in four habitats in 1952 and were considerably reduced by the floods.

Trichoptera. No larvae were found in 1953, but adults of *Limnephilus centralis* and *L. affinis* occurred in the Phragmites area, though in reduced numbers as compared with previous years. They had probably survived the floods as pupae.

Hemiptera. Hydrometridae. *Gerris thoracicus* was the only species identified in 1953 out of five species recorded in 1952.
Notonectidae. *Plea leachi*, *Notonecta viridis* and *N. glauca* were confined to PMM.
Corixidae. The commonest species was *Corixa stagnalis*, found in most habitats with salinities of 60% downwards.
Corixa lateralis occurred in three habitats (maximum salinity about 40%). The other corixids were confined to single habitats: *C. falleni* (BCP., 60%), *C. selecta* (IP., 43%), *C. praeusta*, *C. punctata* and *C. striata* (these three in PMM., 20%). There was a considerable reduction in the corixid population as compared with 1952, in which year *C. punctata* and *C. striata* were much more widely distributed. Ten species occurred in 1952 which were not found in 1953. These include *C. affinis*, *C. linnei* and *C. nigrolineata*, which were common in 1952.

Coleoptera. Haliplidae. *Haliplus obliquus* (BCP.), *H. lineatocollis* (LBD.) and *H. ruficollis* (LBD. and PMM.) had all occurred previous to the floods.
Hygrobiidae. *Hygrobia hermanni*, found before the floods in LMC., had disappeared in 1953.
Dytiscidae.
Hygrotus inequalis (BCP., IP., PMM.), maximum salinity about 60%.
H. parallelogrammus (IP.) (43%).

Coleoptera
Dytiscidae—*coni.*

Hydroporus pictus (PMM.) (20%).

H. planus. Very common and widespread, occurring in cart ruts and other new and temporary habitats. Maximum salinity 60%. It was very much less common in 1952 when the main species was *H. palustris*, which was not found in 1953.

Agabus conspersus. Common and widespread, occurring in temporary habitats. Maximum salinity 60%.

A. bipustulatus. Only in IP., much more widespread in 1952.

Colymbetes fuscus. IP. and two new habitats; common also in 1952. Maximum salinity 43%.

Hydrophilidae. *Hydrobius fuscipes.* Common and widespread. Maximum salinity 60%.

Anacaena globulus. One specimen in BD. where the salinity was 7%.

Enochrus bicolor. Prior to the flood it was found in WBB. but became one of the commonest and most widely spread insects in 1953. Maximum salinity 73%.

Ochthebius marinus PBD. and one of the new habitats. Maximum salinity 40%.

Helophorus brevipalpis and *H. minutus.* These species are so close that reliable determination could not be made in most cases. They were very common and occurred in nearly every habitat in 1953. Maximum salinity 60%.

H. flavipes. Not so common as the foregoing, but widely distributed. Maximum salinity 55%.

Gyrinidae. *Gyrinus caspius* occurred in PBD. (40%) and larvae of *Gyrinus* sp. were found in PMM.

Helodidae. *Cyphon* sp. larvae found in IP.

Diptera.

The main changes noted were the increase in *Ephydra riparia* whose larvae (found in a maximum salinity of 60%) had previously been confined to WBB. *Corethra* sp. had disappeared. *Chironomus* larvae (probably *C. riparius*) were found in a salinity of 43%, and made up an important part of the fauna of the new habitats of 1953. *Stratiomys furcata* was found in BD., near its previous habitat in WBB. and may have survived the floods.

INVERTEBRATES OTHER THAN INSECTS

The changes in the other invertebrates have already been incorporated into the Spurn Report. Amphibian tadpoles and the snail *Limnaea pereger* disappeared, except for some specimens of the latter found in the water butt at Warren Cottage. The other molluscs and the crustacea survived, together with the three-spined stickleback and the worm *Nereis diversicolor* (in WBB.). A number of additional species of crustacea and molluscs and also the flounder were introduced by the flood waters.

CONCLUSIONS

The flooding with salt water considerably reduced the number of species of insects, as may have been expected. In some habitats, such as the Land Mine Crater in Marsh Meadow and the Bomb Crater in the Phragmites Area, the effects were very striking, these places appearing lifeless in comparison with former years.

Walker Butts Bank Dyke, on the other hand, except that part of it had been filled in when the sea broke through the adjacent bank, seemed to have changed little. Boundary Dyke had been cleaned out to improve drainage after the flood and its fauna was thereby impoverished, even though its salinity was not drastically changed.

Most of the species found in July 1953, were good migrants and might have flown into the habitats during the early summer of that year, after the flooding. The 1953 population, however, is largely made up of species which can live in water of high salinity, and which prior to the flooding were characteristic of Walker Butts Bank Dyke and similar places, and some survival of the floods is quite likely. It is possible these species escaped by being buried in mud at the bottom where the

effects of the sea water were not strongly felt. It may be expected that as the salinity of the ponds and dykes declines the fauna will gradually become enriched by the migration of more species, which are less able to stand up to high salt concentrations, from habitats further inland.

The continued study of the area over the next few years should provide very interesting results, bearing upon the ability of species to live in brackish water and on their ability to migrate. It is hoped that this article will encourage those who have the time and opportunity to visit Spurn during the coming summer and examine the fauna of the ponds and dykes. It would also be of great advantage if records of the salinities of the various habitats could be made.

CONCLUSIONS

P. M. BUTLER AND W. D. HINCKS

Perhaps the most unexpected result of the Spurn survey is the richness of the fauna. The numbers of species recorded in the various groups are as follows: Lepidoptera 360, Carabidae 96, Staphylinidae 200, other Coleoptera 311, Hemiptera 79, Hymenoptera 366, Diptera 216, other insect orders 42, Arachnida 117, Myriapoda 13, higher Crustacea 23, Lumbricidae 12, Mollusca 30, Vertebrata (except birds) 20: total 1,885. In addition about 300 species of Hymenoptera and Diptera await identification bringing the total to nearly 2,200 species. Further collecting would no doubt add to the list, even in the groups which have been intensively studied, and there are many groups which were not collected or in which the material has not been completely identified: Collembola, Thysanoptera, Psocoptera, Anoplura, Aphididae, Chironomidae, Cecidomyiidae, Acalyptrate Diptera, parasitic Hymenoptera, Enchytraeidae, Crustacea Entomostraca, marine worms and internal parasites.

Collecting was moreover confined to seven periods of ten days, always in the months of June, July and August, and more extensive investigation over the whole year would no doubt bring to light many more species. It may be of interest here to give approximate totals for the number of species of insects and arachnids collected in 1947 and of the additional species added to the list in subsequent years. These totals are as follows: 1947, 500 species; 1948, 288 additions; 1949, 331; 1950, 220; 1951, 127; 1952, 194; 1953, 107. It should be noted that much of the 1953 visit was devoted to special work and that the total includes the records of only five of the members present.

Altogether, it may be estimated that between a fifth and a quarter of the British fauna could be found within the area studied, amounting to less than a square mile. This in spite of the fact that the district is almost bare of trees and is strikingly monotonous at first sight. Closer investigation however has revealed a wide range of environmental conditions. In addition to the sand-dune habitats, there are the damp clay conditions of the Phragmites area, the salt marsh, and the inland water habitats of various degrees of salinity. The foreshore has a characteristic fauna, and there are cultivated fields immediately adjacent to the Warren. Each of these main types of habitat can be broken down into a variety of micro-habitats; thus each species of plant would have its characteristic fauna, and local edaphic differences would have a direct influence on the distribution of animals. The unravelling of the numerous interrelationships between plants, animals and physical environment is largely a task for the future.

The subdivisions of the area decided upon at the beginning of the survey have proved unsatisfactory in many ways. Apart from the Main Ridge and Marram Dunes, and the Phragmites area of the Warren, all the areas are heterogeneous and provide overlapping conditions. Thus the Warren includes sandy areas as well as clay, and in the vicinity of the Cottage it includes ground formerly cultivated. The Salt Marsh includes the adjacent shore and dunes. The Marsh Meadow includes runnels with salt-marsh vegetation. The Dyke includes salt-marsh conditions along its edge, as well as the aquatic habitat itself. It is not surprising therefore that less than half the species were confined to one area, e.g. 12 out of 28 species of Chrysomelidae, 20 out of 49 species of Curculionidae, 54 out of 117 species of Arachnida.

The mobility of animals of many species further adds to the difficulty of tying them up neatly with a particular habitat. Rapid ground-runners, like some beetles and spiders, are found in all sorts of environment, and flying insects may be carried by the wind or attracted by flowers or light far from their breeding haunts. An

outstanding example is the occurrence of *Tortrix viridana* (Oak Tortrix) far out on the mud of the Humber estuary; another is the invasion of the area by considerable numbers of *Phyllobius pyri* in June 1950. Many species recorded are no doubt chance visitors like these. Until more is known of the distribution of the larval stages, the status of many species must remain doubtful.

To illustrate the numerical difficulties encountered we give the results of searching over six quadrats of about a square meter in different types of environment.

1. July 1950. Top of Humber shore, near Salt Marsh; pebbles, *Arenaria peploides*, some dried weed and a few pieces of drift wood: 11 species.
2. July 1953. Sand, *Carex arenaria* and a little *Elymus maritimus*, near Humber shore, under drift wood carried well away from normal high tide mark by the flood: 20 species.
3. July 1952. Sand, clumps of *Ammophila arenaria*, ground between covered with moss: 22 species.
4. July 1952. Thin layer of soil on sand, Main Ridge; *Hippophaë rhamnoides* dominant plant: 15 species.
5. July 1950. Main Ridge, old dune flora, largely *Ammophila arenaria*, with intermediate cover of other grasses, *Valerianella*, *Sonchus*, etc.: 15 species.
6. July 1953. Phragmites Area, dried marsh on clay, covered with salt water during the flood: 17 species.

In each of these small areas the vegetation was made up of one or a few species, yet the number of animals found ranged from 11 to 22 species. In the more varied habitats, such as parts of the Warren or the hedgerows by the sides of the lane, the number of species would be considerably greater. Moreover, quadrats two and six were from areas which had been inundated during the flood and impoverished in comparison with previous years.

The flooding of a large part of the area by sea-water on February 1st, 1953, must have had an important effect on the fauna. The effects on the ponds and dykes were fully investigated and are reported on by Butler and Popham. The water broke through Walker Butts Bank and covered the Marsh Meadow, it removed a strip of sand-dunes along the Humber shore near the Cottage, and on the North Sea side it removed the Main Ridge near the Phragmites Area, so that the latter was covered with sea-water. Most of the Main Ridge escaped, however, together with the field immediately behind the Cottage, and a hill to the north of Kilnsea, on the way to the Saltings. A considerable difference in the abundance of many species was noticed in 1953 as compared with 1952, much of which was no doubt due to the flooding, but it must be remembered that owing to weather conditions and other factors each year that we visited Spurn had its pecularities. The following are some of the features we noted in 1953. The wild carrot flourished exceedingly and the sea rocket had increased, being often plentiful on bare, washed-up sand. *Senecio erucifolius* had become much more widespread than in previous years but *S. jacobaea*, on the other hand, was adversely affected. The *Phragmites* was noticeably stunted in growth and thistles and burdock were similarly affected in what had been flooded areas. Teasles only appeared to have survived in unflooded areas and moss was gone from the parts of the Warren where it previously flourished.

The only adult Dragonfly seen was *Ischnura elegans* which was plentiful. Trichoptera were very reduced in numbers and only two species of *Limnephilus* occurred in small numbers on the Warren. The usually common spider, *Tetragnatha extensa*, seemed absent from the Dyke and *Araneus quadratus* was much reduced in numbers. On the other hand Thysanoptera were noticeably more numerous than usual.

Of the Coleoptera *Psylliodes marcida* thrived with its food-plant sea rocket. Among the Staphylinids shore species were plentiful and had extended their ranges but only a single species was noted in the Phragmites Area under detritus. *Bledius limicola* appeared to have extended its range from the Dyke to the crater pond in the Phragmites Area where it replaced *B. occidentalis*. In the Phragmites Area a few beetles such as *Coccidula rufa*, *Corticaria* spp., and Helodids seemed little affected. Grasshopper colonies seemed normal and existed on the Warren even in areas known to have been flooded.

Noticeably deficient species in the Hymenoptera were members of the genus *Harmolita* (*The Naturalist*, 1953: 138) which gall the stems of couch grass. The gall is normally low down and the plant grows in areas which were flooded. Wasps of the genus *Odynerus* were entirely absent and Crabronids were very scarce. Bumble-

bees seem unaffected and probably survived because the queens tend to hibernate in banks. One thriving colony was found nesting in a mass of seaweed washed into the Phragmites Area by high seas. The usually ubiquitous crucifer-feeding sawflies of the genus *Athalia* were entirely absent and spider-wasps (Pompilids) and Bethylids were much scarcer than usual.

The fly *Nemotelus uliginosus* which has an aquatic larva was exceedingly abundant but the related *Stratiomys furcata* with a similar larva was scarce. *Villa paniscus* was more abundant and widespread than during any previous season. Mosquitoes were scarce and few larvae were found. Hover-flies, many of which pupate on the ground, were much reduced in numbers but the beautiful Dolichopodid *Poecilobothrus nobilitatus* was abundant everywhere, more so than usual. *Ephydra riparia* was much more widespread than in previous years but Therevids were much scarcer.

***Tortula subulata* Hedw. var. *graeffii* Warnst.**—In *Trans. Brit. Bry. Soc.* 1953 Dr. A. C. Crundwell described the above moss which has so far been recorded from V.C.s 96 and 105, both in Scotland. In 1949 I collected a robust form of *Tortula subulata* with other unusual characteristics, from Ingleton. I submitted the gathering to Dr. Crundwell, who agrees that it is the var. *graeffii*. All the gatherings were from calcareous habitats.—J. A.

A rare *Weissia*, new to Yorkshire.—In late October 1953 I collected a small moss on the edge of a damp pasture field near Hipperholme. It had a superficial resemblance to *Pseudephemerum nitidum* but the capsules were a different colour, longer and more glossy. It was *Weissia rostellata*. The capsules were fully formed and had the colour of ripe fruit but had not dehisced. Dixon gives the time of fruiting as winter. Dr. Warburg confirmed the naming.—J. A.

BOOK REVIEWS

The Natural History of the Scarborough District. Vol. 1. Geology and Botany. With eight plates and a map. Published by the Scarborough Field Naturalists' Society, 12 The Close, Newby, Scarborough. 21/-, plus 6d. postage.

The Scarborough Field Naturalists' Society with its predecessor the Scarborough Philosophical Society, dates back to 1827. It has always had its keen and able naturalists and their labours have now been crowned by the publication of this most valuable record. The first volume deals with the Geology and Botany of a district of about fifteen miles round Scarborough, a district, as Professor Pearsall remarks in his Preface, of ' varied rocks, moors and wolds, valleys and escarpments, woodlands and meadows.' The fact that the district borders the sea adds a good deal to its variety and interest.

The record here published is a most comprehensive one, including every branch of natural history except those connected with animal life, which are being reserved for Volume Two which it is hoped will appear in 1954. The longest section is that on Fungi, occupying eighty-six pages and listing some seventeen hundred species. It is closely followed by the eighty pages devoted to Vascular Plants, while among other sections are localities for Fossils (30 pages), Lichens and Mosses (17 pp. each), and Liverworts (5 pp.).

The principal part of each section consists of a list of species with localities, notes on frequency, and for the rarer species the initials of the finder in each locality. The book is not, however, a mere succession of lists, for well-known experts in each special subject have contributed introductions which do much to knit together the lists into one organic and living account of the natural history of the district. The Scarborough Society has for many years been a constituent member of the Yorkshire Naturalists' Union and the benefit of this association with the Union comes out in many places in the book and not least in the introductory accounts of the various sections.

The value of the book to students of plant distribution for example—and it will have great value for many others as well—will depend largely on the fullness and accuracy of the lists of species. The section on Vascular Plants in particular comes well out of a rigorous scrutiny. I have found no mention of the occurrence of *Bromus*

lepidus Holmb. found near Staxton on the Y.N.U. excursion of 1943 and the inclusion of a record of *Puccinellia rupestris* (With.) Fern. and Weath. found at Flamborough in 1935 and published in *The Naturalist* would have made a very considerable extension of the area of that species. These are almost negligible omissions in a wonderful set of records.

In nomenclature the wisdom of the editors in submitting the records of each section to an acknowledged specialist is shown in the result where the most modern naming has been attained throughout. Alas that the passage of time is bound to show that changes in this difficult field will become necessary !

The English naming of plants has, no doubt, set the editors a troublesome problem. Among the fungi, where such a small proportion have English names, the short list provided of those which have, is probably the best solution of their problem. In the case of the Vascular Plants it is doubtful whether the decision to rely on Turnbull's index of 1889 is a sound one. It has resulted in two quite different species being both called Common Sedge. Some cumbrous and obviously artificial names are used, e.g. Square-stalked, Short-podded Willow Herb for *Epilobium obscurum* and an inaccurate name in Sea-side Cat's Tail Grass applied to *Phalaris arundinacea*, a species which has no special connection with the seaside.

In the sections on Geology a very curious fact is the omission of any reference to the work of H. H. Thomas, whose work on a new group of fossil flowering plants, the Caytoniales, based on material found at Cayton and Gristhorpe, has received wide recognition elsewhere, and is alluded to in his Presidential Address to the Yorkshire Naturalists' Union (*The Naturalist*, February, 1939).

It is perhaps too much to expect that fuller accounts of the plant ecology of the district and of the connection between its glacial history and its present plant covering should have been included. Yet how interesting such accounts for such a district would be ! It would be a fascinating study to follow both history and detailed ecology of such outstanding plants as the May Lily, the Dwarf Cornel, the Chickweed Wintergreen, and the Hayscented Fern. These all no doubt have a connection with the Scandinavian land-mass across the sea to the north-east, and remain where they are now found because of their ecological niches being similar to those in their Scandinavian home. Such studies are for the future, meanwhile the book sets a worthy seal upon the work of members of the Scarborough Naturalists' Society, and the editors, G. B. Walsh and F. C. Rimington, are to be heartily congratulated upon the completion of this part of their labours.

The value of the book is enhanced by the inclusion of eight well-chosen and beautifully produced plates and by many illustrations in the text.

A. M. S.

A Guide to the Geology of the district around Ingleborough, by **K. C. Dunham, J. E. Hemingway, H. C. Versey and W. H. Wilcockson.** Reprinted from ' Proceedings of the Yorkshire Geological Society, 1953, vol. 19, part 1.' Price 4/6, post free (copies can be obtained from the Secretary of the Society, Department of Geology, The University, Leeds, 2).

The stretch of country around Ingleton, Chapel-le-dale, Austwick and Ribblesdale is outstanding in the Pennines for its diverse geology and impressive scenery, and the interrelation of these two aspects is rarely better displayed. To the stratigrapher the region is also well known as one of the few places where the basement strata of the Pennines (Ingletonian and Lower Palaeozoic) can be seen, in the valley floors; above these, the hillsides are formed of the massive Great Scar Limestone, with its caves, grykes and clints, and the variable Yoredale Series, while on Ingleborough the capping of Millstone Grit produces the characteristic outline of that mountain.

Nevertheless in spite of its geological attractions, which draws many field workers to Ingleton, Austwick and Ribblesdale every year, the region has had no general account since 1910, and indeed there have been few contributions of substance in the last twenty years. A new guide is therefore welcome. The present one is the work of four authors jointly and contains 38 pages of text, 5 maps and 9 half-tone photographs. In addition to serving strictly as a guide, with references to the most accessible sections and important localities (perhaps rather liberally pointed with National Grid references) there are general descriptions of the main geological formations. This makes the work into a useful contribution to Yorkshire geology, and in particular those sections on the Coal Measures of the Ingleton Coalfield and

the Carboniferous rocks north of the Craven faults add information and coherence to what was already known. A slight lack of balance might be found in greater detail accorded to the Ordovician and Silurian outcrops, but they are probably the best known and the four detailed maps of the Austwick and Ribblesdale valleys will be useful to those exploring the region.

The professional stratigrapher may perhaps feel a little unhappy about retaining the name Coniston Limestone Series (with its traditional implication of Caradocian age) for rocks which are now placed in the Ashgillian—nor are the reasons, presumably sound, for this transference made clear. Such points are, however, minor ones in a publication, put out at strictly cost price, which will add to the pleasure and information of many geologists and naturalists in this most rewarding piece of country.

British Spiders, by **G. H. Locket** and **A. P. Millidge.** Vol. 2, 449 pp., 254 text figs. London, Ray Society. Price 30/-.

Students of *British Spiders* are indeed fortunate in now having an up-to-date handbook in the small compass of two volumes. Gone are the days when they were compelled to work with the excellent, but out-dated, and difficult books of Blackwall and Pickard-Cambridge. Indeed the completion of this work by Mr. Locket and Dr. Millidge marks the beginning of a phase of quickened interest in a rather neglected but fascinating group of animals.

The present volume includes families 18 to 24 (Agelenidae to Linyphiidae) together with Addenda to Volume 1, a Check List and Bibliography. When it is realised that 380 species of spiders are included in this volume and that no effort has been spared to render the illustrations as clear and numerous as possible, it will be obvious that many of the specific descriptions are of necessity rather brief. By a most judicious selection of the relevant taxonomic data the authors have admirably achieved this miracle of condensation. Distributional data are inevitably condensed but this is essentially a systematic treatment—a primary need of British students —and is well adapted to their requirements. The illustrations include some showing the general facies but most are detailed drawings of the male palps and epigynes which provide the safest taxonomic characters.

No less than 234 pages are devoted to the large and critical family, Linyphiidae and the careful treatment in the present volume should do much to enable these difficult little spiders to be correctly identified. The taxonomy is still ' critical ' and demands close attention to the keys and the material studied must be mature and in good condition.

It would be invidious, with such an excellent and essentially sound work, to look for points to criticise. Indeed the only omission which struck the reviewer was the absence of a citation of the generotypes of the numerous genera, a very small matter.

The Ray Society and the authors are to be most heartily congratulated and greatly complimented on the provision of a much needed and competent work which will remain the standard text for British Spiders long after the books themselves are ' out of print '.

Land Birds of America, by **Robert Cushman Murphy** and **Dean Amadon.** Pp. 240, 221 coloured and 43 black and white photographs and a few line drawings. McGraw Hill Book Co., Ltd. 100/-.

' This book is not intended to serve primarily for the identification of birds in the field, but it does depict several hundred species of land birds through the unimpeachable records of color photographs . . .'' That, in the main, tells what the book is: the 221 colour photographs are a superb achievement—and collection. They signify many, many hours of patient waiting and countless disappointments too, before a satisfactory result was obtained. But the pictures are not all; the written matter is ably presented and free from the technicalities that so often deter the general reader. It might be called a ' fireside ' book for its size, $12\frac{1}{2} = 9\frac{1}{4}$ inches, makes it difficult to hold in the hand. The presentation of matter in two columns on a page is alien to British readers but the printing is excellent.

Most Old World ornithologists at sometime or other will have wondered how many British birds could be found in America and from this book it is possible to determine that point so far as land birds are concerned. About 380 birds are here mentioned; the comparable number on the British list is about 350, yet only 46

species are common to both our of 54 genera with dual representation. A striking feature is that not one of our many warblers is present in the new world, nor can we claim one of their 30 species. Our *Falconiformes* has the best showing for land birds: of the genus *Falco*, species *peregimus, tirnunculus, columbarius* and *rusticolus* all occur ' over the water.' A number of *Strigiformes* are there too. It is possible that there may be cases of the same bird appearing in both countries under different names as the Kildeer Plover: on the British list this is *Oxyechus vociferus:* in this book the name is *Charadrius vociferus*. The U.S.A. have a variety of jays while they possess about 30 species of flycatchers, many of them difficult to separate except by their notes. The sparrows of America correspond to our buntings and finches.

Unlike our species, the American cuckoos are not parasitic; that role is taken by the Cawbird (we have no equivalent), with this difference; the young bird does not eject the foster-parents eggs or chicks, but since the cowbird's egg hatches a few days before the other eggs the young bird grabs all the food and the true occupants of the nest just die of starvation !

During winter the ' poor-will ' (a small goat-sucker), is often found in a semi-torpid condition or partial hibernation when its body temperature drops 34°. So far it is the only known bird to do this, but whether all members of the species do it is not yet fully explored.

The sub-division of species has evidently found some favour in America for the Screech Owl, ' what biologists call a plastic bird', has been sub-divided into 15 ' North American Geographical races ! '

The authors deprecate the introduction of European species to their country: many attempts have been made but the only two which have proved successful are the house sparrow and the starling. The latter bird was not introduced till 1890 but in some states it is already regarded as a pest.

As has happened in this country, America has lost a few of its birds through the activities of man, either uncontrolled destruction or the result of industrialism and population increase. Americans also have the same desire to shoot birds, particularly raptores, though it has been proved that the Marsh Hawk (our Hen Harrier) is really a ' friend ' of game birds.

Some American birds' names are the remains of the nomenclature used by the early settlers who gave an English name to any bird that bore resemblance to one at home: hence a fairly common bird with a reddish breast was called a ' Robin ' though in all other respects it more closely resembles our Song Thrush. The English Robin is not known in America. Why a bird should receive such a name as ' Chuck-Will's Widow ' is, along with other names, explained in the text.

The authors consider that the small differences which exist between the species of the same genus in the Old World and the New are probably due to a varied evolution caused by climatic and topographic dissimilarities.

There is some excellent advice in Eliot Porter's chapter on bird photography which concludes a very fine book.

J. P. U.

Living Fossils, by **Maurice Burton.** Pp. 282, with 83 line illustrations. Thames and Hudson, London and New York, 1954. 21/- net.

This is one of the books in the series ' The Past in the Present ' under the general editorship of Jacquetta Hawkes.

Dr. Maurice Burton is a Deputy Keeper of the British Museum (Natural History), Science Editor to *Illustrated London News* and author of several volumes on animal life. The present book is therefore the work of an acknowledged master. It deals very largely with animals which seem to be anachronisms in a modern world, Platypus, Tuatana, Peripatus, King Crab, Lingula, Coelacanths, and many others of like status. Dr. Burton deals with the most outstanding features of their structure, with their natural history, their geographical distribution and with the possible causes of their survival. Inevitably there is some discussion of the general biological principles underlying survival and extinction, with by no means stereotyped observations on classical ideas of evolution, adaptation, variability and so on.

The book will be found to be absorbingly interesting even to the well-informed zoologist and naturalist; it is certainly easy to read, the author showing marked ability to create mental images in the mind of his reader. It is highly recommended to all readers of *The Naturalist*, young or old.

H. H.

Wildlife Management (Fur Bearers, Waterfowl, and Fish), Vol. II, by **R. E. Trippensee.** McGraw-Hill, New York, 1953. Numerous photographs, line drawings and diagrams. £3.

The first volume of Professor Trippensee's work (1948) dealt with upland game animals; this is concerned with the animals (fur-bearing mammals, wildfowl and fish) of wet areas such as marshes, rivers and coastal swamps. The book consists of two introductory chapters on water and its conservation, chapters on the ecology of the three faunal groups concerned, and life histories of the species within each group which are most important to the commerce and recreation of the citizens of the U.S.A. While the life histories are merely digests of information already well known to specialists, the introductory ecological chapters, dealing with conservation of species valuable to mankind and control of predators, are of especial concern to people in Great Britain interested in such matters, in which we are at least 38 years behind the U.S.A. and are likely to become even more retarded: I say this advisedly, because the international agreement on migratory birds between Canada and the United States was ratified in 1916 and our own projected bill for the Protection of Wild Birds—in so far as it affects wildfowl—is by no means so satisfactory, perhaps on account of the selfish and unrealistic attitude of our ' sportsmen '. Professor Trippensee's observations are admirably realistic, dwelling on the recreational and profit-making aspects of man's character, rather than on the sentimental and aesthetic—both of which are liable to bring wild-life conservation into contempt among certain classes.

The fact that different chapters of the book are by different authors explains a certain amount of repetition in the text. The bibliographies are helpful, but the photographs are, for the most part, lamentable; they are poorly reproduced and, often, badly taken. We can no longer be satisfied with plates of stuffed specimens or photographs taken straight into the light, like that of the Whistling Swan. Among the line drawings those by Peter Ward are both pleasing and lifelike.

The book is rather a work of reference than a book to be read from cover to cover, but the methods suggested (extremely practical ones) for preserving wild fauna in damp areas should be read by the backward Britisher whose ideas on the subject (e.g. with regard to the destruction of hedgehogs and Hen Harriers) appear to be a great many years out of date.

M. F. M. M.

Mushrooms and Toadstools, by **John Ramsbottom.** 306 pp.+84 photographs in colour and 58 half-tone illustrations. New Naturalist series; Collins, London, 1953. 30/- net.

This is a book for the mycologist, the naturalist and the general public. It is based upon Dr. Ramsbottom's sound and practical knowledge of the fungi, but, more than any other volume, considers their relation to mankind. We are, for example, given not only an adequate idea of the more conspicuous members of the British fungus flora, but also a description of their association with other types of vegetation. Ergot of nye and grasses is not only described as a species with an interesting life-history, but the social implications of its production and use as a drug, and its unrestrained devastation as a poison are combined with a history of man's awareness to this fungus. Stinkhorns, even, are treated with a light consideration which robs them of their usual ostracism. What could be more delightful than a *Phallus* which was said to have ' a scent somewhat like violets at a distance, when growing ', even though it ' was very offensive when dried '? That, however, was in 1833, and things seem to have changed since then.

The fascinating story moves from fairy-rings on Stonehenge to the commercial production of *Penicillin*, from truffles to dry-rot, from luminosity to mycorrhizal associations. Numerous illustrations help the text considerably; those in colour (many by Paul L. de Laszlo) are excellent, and those in half-tone lack nothing in quality. The volume is concerned principally with the ' wild ' fungus flora; there is no attempt to consider crop diseases. It is not a handbook of species, neither is it for the dilettante. It *is* a book fully worthy of its predecessors in the *New Naturalist* series, which gives in good literary prose a vivid, detailed and living account of the principal field fungi of Britain. It is detailed for the scientist and interesting for the citizen

J. G.

A Coleopterist's Handbook, by **Geo. B. Walsh and John R. Dibb,** Editors. Being Volume II of the *Amateur Entomologist.* Pp. 120, 50 figures, 20 plates, stapled in stiff covers. Amateur Entomologists' Society, 1954. 15/-.

The present volume is designed to give practical assistance to those commencing the study of beetles, to whom it will be of considerable help. It deals comprehensively with collectors' equipment and the methods of killing, preserving and storing, and if at times the recommendations seem too elaborate there are always simple alternatives that can be used. Not only the adult beetles are treated, for a quarter of the volume is devoted to larvae and designed to stimulate interest in this comparatively neglected field. Separate chapters deal briefly with photography and with the beetles of stored products, and there is a list of species associated with various plants which, while not claiming to be exhaustive will be of great assistance to the collector.

After the initial stage of collecting, the entomologist is sensibly advised to concentrate on more specialised methods, and the enumeration of suitable habitats for exploration is almost exhaustive, and is the fruit of much experience. Opinion may vary as to the suitability of certain species for inclusion among the examples that are freely given for each habitat. One would be fortunate indeed to find *Nebria nivalis* even on the ' highest mountains in Scotland ', but the much more likely—and spectacular—*Carabus glabratus* is omitted from the list of mountain beetles. The field for selection of examples, however, is so vast that it would be cavilling to criticise what is, after all, but a selection, and a good one at that. It may be thought that an undue proportion of space is devoted to the beetles of ants' nests—a quarter of the entire section on collecting methods—and there is some repetition here.

The work is suitably illustrated with diagrams of apparatus and some good plates chiefly figuring larvae which include beautiful examples from Schiödte. The editors, both well-known coleopterists, are responsible for a goodly proportion of the work, and they have obtained contributions from a number of experienced entomologists. Articles from periodical and other literature are freely quoted. Several slips, however, have escaped the proof reader. Page references have been left blank on pages 7 and 9, and the words ' ants ' and ' beetles ' appear to have been transposed in lines 39 and 40 on page 19.

J. H. F.

Ways of the Ant, by **John Crompton.** Pp. 254, with 8 drawings by J. Yunge-Bateman. Collins, 1954. 15/-.

The author is a very able purveyor of popular natural history for those whose curiosity can be satisfied by a little light reading, and while this book will scarcely appeal to the entomologist it will be enjoyed by many who will have no urge to read further on the subject. The anthropomorphic treatment which would irritate the biologist makes easier reading for the layman, and the whole is sprinkled with not always relevant anecdotes. It would be churlish to examine too closely the opinions expressed in a work intended primarily as entertainment (and very successful it is in this field) and taxonomists are unlikely to be deeply hurt by the slight regard in which Mr. Crompton holds them.

Briskly and breezily, exploiting every opportunity for humour, Mr. Crompton has selected from a wide range of sources accounts of those ants most likely to inspire the reader with wonder—harvester, driver, slave-maker, mushroom-growing and other ants and the termites—and sketches vividly their lives and habits. His net has been cast widely, and his ants come from England, South Africa, South America and Australia. The concluding chapters on ' intelligence ' and ' British ants ' serve little purpose and could well have been omitted. Those who decry the manufacturing of ' popular ' names where these are not already in general use may note that few of Mr. Crompton's names tally with those of Mr. D. Wragge Morley, to whose recent work the reader is referred for further information.

J. H. F.

Key to the Names of British Birds, by **R. D. Macleod.** Pp. 67, $8\frac{1}{2} \times 5\frac{1}{2}$. Pitman, 10/6 net.

The purpose of this book is ' to create and stimulate an interest in the scientific names of British birds, and to explain the meanings of both common names and scientific ones'. The purpose is well served. The book is a little mine of information concerning derivations, a knowledge of which is undeniably helpful to all who take their birds seriously. It meets some difficulties of the many among us who have

' little Latin and less Greek'. Difficulty has been experienced in finding reasons for a few common names which gives a reader an opportunity to exercise his own experience and verbal ingenuity. The names listed are those of *The Handbook of British Birds*; and the changes made, and attempted, by the B.O.U. List of 1952, scientific and common, remain unexplained, perhaps inexplicable in a few cases !

R. C.

London Bird Report. Pp. 73; 2 illustrations; 4 maps. London Natural History Society, 2/6.

It is said that representatives of every section of the globe meet in London. That statement may not be quite true regarding birds but when it is noted that no less than 190 species were recorded during 1952, including Great Northern Diver, Gannet, Velvet Scoter, Osprey, Peregrine, Wood Sandpiper, Avocet, Stone Curlew, Hoopoe and Snow Bunting, one cannot keep thinking there must be some fascination about the City and its environs.

The report is admirably produced and well displays the keen and highly co-ordinated observations of the Society.

The ' Bird Population of Four Gravel Pits, 1948-1951 ' is most interesting.

The Natural History of the City, by **R. S. R. Fitter** and **J. E. Lousley.** Pp. 36 with 12 photographs, 1 map and 1 line drawing. The Corporation of London, E.C.2.

The main body of the booklet gives a short but well written account of the most notable features of the flora and fauna of the bombed sites of the City, following a historical account of the study of Natural History in the area. This is admirably supplemented by an appendix containing lists of plants, birds and mammals recorded since 1942, together with their scientific names; there is also a welcome list of references. The section concerned with flowering plants occurring on the bombed sites is arranged according to alleged methods of introduction. One is left wondering whether some statements concerning dispersal are justified, but omission of evidence for such beliefs is inevitable in so short an article.

F. E. C.

The Hill of Light, by **G. D. Adams.** Pp. xii+200. Constable. 12/6.

There are not many people who know much about badgers, indeed, as Frances Pitt says in her admirable foreword: ' You can have badgers almost under your nose and never see them.' One might say that the majority of people look upon ' Brock ' with distrust; the reason being that they know nothing about the animal save perhaps a few ' old wives' tales '—and in any case is he not vermin? This wanderer of the night is not only unobtrusive he is also elusive and anyone who has seen a badger ' in the wild ' has had a vision claimed by very few.

Down through the ages, because of his secretive ways, Brock has been regarded with suspicion and consequently ' tainted '; hence some of the queer interpretations of his behaviour and the sinister aims of his goings and comings.

In this book Mr. Adams gives a fair and unbiased account of the life of a badger through the seasons. There are no protection excuses for anything he does; both good and bad have equal descriptions but when the end of the book is reached and a summing up is made there can be no doubt that the merits of Brock far outweigh his sins of either omission or commission.

But this book contains much more than accounts of Grey and San, etc.; it is alive in the descriptions of the Welsh border country in Radnor and Shropshire: of hills and cwms, woods and dingles and of the other animals, birds, insects, etc., and humans which go to make up the countryside. The effects of seasonal changes are clearly displayed, and the impact of modern methods in agriculture and forestry is not omitted. Corvo, the old raven; Mulo, the buzzard; Chee, the greenfinch; Fang, the fox; Jasper, the old man; Will, the trapper, and many more characters go to make up a vivid picture of real country life.

One feature brought out by this intensive study of wild life is the high mortality among the denizens of the woodlands, etc.: it is almost surprising that some species still survive.

I have one criticism. It is a pity there are no more illustrations beyond an excellent frontispiece. Pen and ink sketches depicting the types of country such as

Caldy Top, Goat House Dingle, Acton Pool, Bryn Wood, etc., would have been an added interest, and I am sure a photograph of Jasper would have been welcome.

A fascinating book; one to pick up time and again to always find something new: that is a test of its worth.

J. P. U.

The Bee Walk: Being the Romance and Practice of Bee-keeping, by **Amy F. E. Lisney.** Pp. 114, 16 plates. Published by the author, 1953. 10/6.

Mrs. Lisney is essentially a practical bee-keeper with a rather sentimental approach to her subject, having little sympathy for the biologist's explanations of bee behaviour. Her style is pleasantly discursive, and embedded in the rather rambling narrative are the items of practical information from an experience extending over many years. This is not a practical treatise, though it contains much that is of value on the management of bees, and it might most suitably be described as a gift book.

The entomologist will be curious to know what the author means by ' extensible ' antennae, and where she obtained the information that nectar is the normal food of wasp larvae.

J. H. F.

Honey from Hive to Market. Ministry of Agriculture and Fisheries Bulletin, No. 134. Pp. 34, 8 plates. H.M.S.O., 1953. 2/-.

A very useful pamphlet covering all stages from removing the crop to labelling the filled jars and marketing the honey. Particular emphasis is laid on methods that will produce a high quality product for sale.

J. H. F.

Diseases of Pests and Horticultural Planting Material: A Guide to their Recognition, by **P. Aitkenhead** and **J. A. Tomlinson.** Pp. iv + 38, with 83 photographic illustrations on 20 plates. Published for the Ministry of Agriculture and Fisheries by H.M. Stationery Office, 6/-.

This booklet is intended primarily as a guide to those officials whose job it is to inspect horticultural plants that are being exported or imported, to determine if planting material—especially dormant or semi-dormant material—is infected with a disease or harbouring a pest. Under each plant the diseases or pests that might be found are listed and their chief diagnostic features briefly described. Many are also illustrated. It should be of considerable help not only to officials but to commercial growers and nurserymen as well as to horticulturists and amateur gardeners generally.

Antibiotics in Livestock Feeding. Advisory Leaflet 418. Ministry of Agriculture & Fisheries.

This leaflet explains the use of penicillin and aureomycin as supplements to the normal feeding of livestock. Since satisfactory results have been obtained only from pigs intended for slaughter and poultry (excluding ducks) up to $4\frac{1}{2}$ months old reared for the table, it is not yet likely to appeal to farmers, etc. A further point against its use is that it is not advisable to use antibiotics with breeding stock.

The UFAW Courier, No. 9, Spring 1954. Published by the Universities Federation for Animal Welfare, London. 29 pp. Price 6d.

This quarter's *Courier* commences with an interesting article on ' The Religious Attitude towards Animals ' by C. W. Hume, followed by a comprehensive paper on ' The Protection of the Rabbit against Myxomatosis in France ' by P. C. Blin of the Ecole Nationale Vét´rinaire at Alfort, dealing with the history of the introduced disease, the virus itself, distribution with map, symptoms, lesions, etc., unsuccessful treatments applied, and appendixed by an adequate and up-to-date bibliography.

Other contributions are about ' The Surrey Chicken ' under battery and intensive systems, ' Dogs (Protection of Livestock) Act 1953 ', ' Questions and Debates in Parliament ' and book reviews.

E. H.

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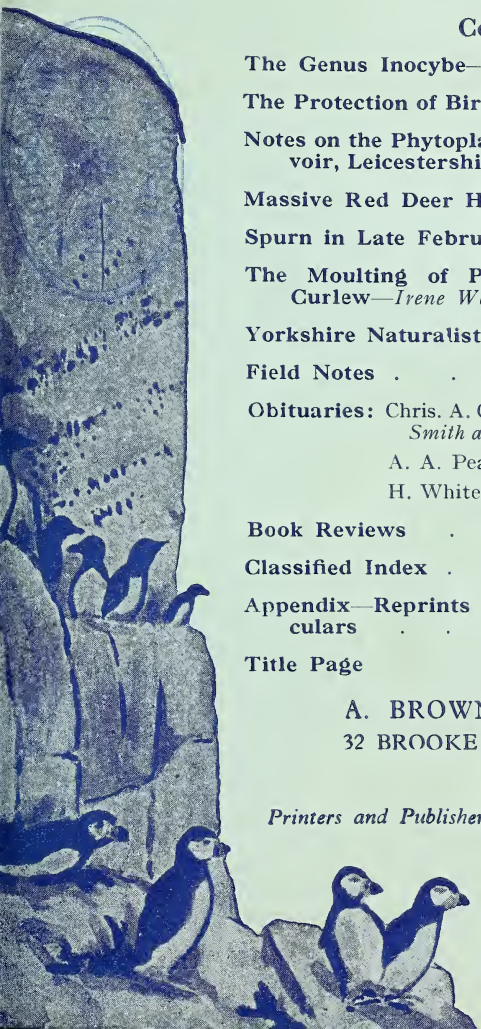

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Will all members please note that the October meeting, to be held on Saturday, the 23rd, will be in St. John's Parish Room, Mark Lane, Leeds, 2 (behind Lewis's Ltd.) and not, as previously, at the Belgrave Rooms. The general meeting will be open at 3-15 p.m. and arrangements have been made for the provision of tea for those members who care to take sandwiches.

Copies of Mr. A. A. Pearson's Paper 'The Genus Lactarius' and second editions of 'British Boleti' and 'The Genus Russula' may be obtained, price 2/6 each, post free, from the Editor of *The Naturalist.*

Copies of Mr. J. Webster's 'Common Pyrenomycetes of Beech Wood' are also obtainable from the Editor of *The Naturalist*, price 2/–, post free.

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Exchange copies of the following periodicals may be had on loan from The Editor of *The Naturalist*, The University, Leeds 2, on receipt of stamped addressed envelope:

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British Birds.
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Science Progress.
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The London Naturalist.
The Scottish Naturalist.
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Transactions of the Lincolnshire Naturalists' Union.
Transactions of the British Mycological Society.

ENTOMOLOGIST'S MONTHLY MAGAZINE. Published Monthly at 4/- per issue (except special issues) Annual Subscription 25/- post free. Nathaniel Lloyd & Co., Ltd., Burrell Street, Blackfriars, London, S.E.1.

THE GENUS INOCYBE

A. A. PEARSON, F.L.S.

[The manuscript of this paper was unfinished though in an advanced stage of preparation at the time of Mr. Pearson's death. Dr. R. W. G. Dennis has kindly seen to its completion and preparation for the press.—Ed.]

Inocybe is a well-defined genus most nearly related to Cortinarius, as was recognised by Fries himself. The distinctive macroscopic characters are the dry, convex, more or less fibrillose or often scaly pileus, sometimes with a slight cortina, the slender stem without ring or volva but often with bulbous base and the light yellowish-brown or grey-brown adnexed or adnate gills, conventionally described as ' clay-coloured ', shedding a snuff-brown spore print. Usually the gills have a conspicuous white pruinose margin. Colour of gills and spores distinguishes it sufficiently from Cortinarius while Hebeloma, with which Inocybe was once united, is separated by its generally smooth and viscid pilei as well as by microscopic characters. Under the microscope the prominent cystidia, either thickwalled and capped by crystals, or thinwalled and bladder-like, are quite unlike the slender marginal hairs of Hebeloma while it is exceptional for Cortinarii to have cystidia at all. Inocybe spores are thinwalled, light brown and never rough or punctate though in one section of the genus they have an undulating, nodulose or spiny outline.

While it is thus easy to recognise an Inocybe as such, even in the field, differentiation of the species is usually a difficult and highly critical matter, so that there has been more than the usual amount of confusion over interpretation of names proposed by earlier authors. Hence many of the specific epithets found under Inocybe in the works of Cooke, W. G. Smith and Rea must be abandoned as of doubtful application to-day. It follows that except for a few really distinctive species the published British records are of little value except where voucher specimens have been preserved or detailed notes of microscopic characters kept.

The principal characters to look for when collecting and trying to name an Inocybe are the following:

Cap.—Shape, size, colour including colour change when handled in white species, surface, whether squamulose, radially cracked, fibrillose, silky or covered with an evanescent cortina when young.

Stem.—Stature, colouring, surface and especially shape of the base, whether bulbose or not and whether the bulb has a clearly defined margin. A character hitherto neglected has been stressed in the new French flora, viz. the distribution of pruina, formed by cystidium-like hairs, on the stem, whether evenly distributed or confined to the apex.

Flesh.—Colour, including possible change when cut, smell, structure in the stem, whether solid or hollow.

Gills.—Attachment, spacing, margin, colour if distinctive but the colour of young gills fortunately has not the significance in Inocybe that attaches to it in Cortinarius.

Spores.—The spore print is a rather uniform snuff-brown but spore shape is of primary importance, especially whether the outline is even (Leiosporae), undulating to nodulose (Goniosporae) or spiny (Verrucosisporae). In the first group the outline may be almond-shaped with both sides of the profile convex, or bean-shaped with one side very slightly concave and the apiculus scarcely developed. In the Goniosporae the number of bosses may be characteristic but it is often very difficult to determine precisely. There is no germ pore. Two-spored basidia are rare in Inocybe but two-spored forms have been described in *I. langei* and *I. descissa*. They have yet to be found in Britain but notes on them have been inserted in the table because they have larger spores than the typical forms.

Cystidia.—These are of two main types, thinwalled and balloon-shaped or cylindrical with rounded ends, sometimes called paracystidia (Depauperatae), or thickwalled, usually somewhat ventricose with a more or less defined neck tipped (' crested ') by a group of small crystals (Muriculatae).

It is by a combination of spore and cystidium characters that the main subdivisions of the genus can be laid down and it is customary to attach primary importance to the distinction between even and nodulose spores. The latter group

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was separated as a genus Astrosporina by Schroeter but it is generally agreed that this was an artificial distinction and that there are close relationships between species in the two series. In his monograph of Inocybe Heim sometimes placed species with nodulose spores in the same group as those with even spores.

Chemical characters have not been extensively employed in differentiating species of Inocybe.

Edibility.—*Inocybe jurana* has been said to be edible but there is a risk of confusion with poisonous reddening species and mycophagists will do well to avoid all species of the genus. Several are known to be highly poisonous, notably *I. brunnea, I. fastigiata, I. geophylla, I. lanuginosa, I. lanuginella, I. maculata, I. napipes* and especially *I. patouillardii*, consumption of which in mistake for mushrooms is known to have killed adults in England. The clay-coloured gills and marked reddening of the pileus when handled should be sufficient distinction, however, for all but the most casual gatherer. Inocybe poisoning is of the muscarine type with blurred vision, vomiting and profuse sweating.

Habitat.—Inocybes are predominantly terrestrial woodland fungi though none has been proved to form mycorrhiza with forest trees. A few occur in fens or on moorlands and a small group, notably *I. dulcamara, I. halophila, I. maritima* and *I. serotina*, are characteristic of coastal sands. Møller found *I. umbrina, I. dulcamara*, dwarf forms of *I. lacera, I. hirtella, I. corydalina* and two small endemic species, *I. nana* and *I. pusilla*, on treeless areas in the Faroe islands. The dwarf form, *subsquarrosa*, of *I. lacera* is known from the Hebrides and the other Faroe species should be sought in the highlands and islands of Scotland.

World Distribution.—This is distinctly a north temperate genus. About 100 species are recognised in Europe, many of which occur also in North America. In marked contrast are Petch's meagre record of two species from Ceylon, one of which is known also from Java, and Massee's three from Singapore. Hennings described one more from Java and three from tropical Africa. Dennis found none in Trinidad and only one in rain forest in Venezuela, but above 5,000 ft. in Jamaica Inocybes were fairly abundant along with other characteristically temperate genera. The genus reappears in the temperate forests of the southern hemisphere. The Australian species have not been adequately studied though Cleland recognised nine in South Australia, but in Argentine Singer and Digilio have already distinguished seventeen species, five of them European and perhaps introduced with European trees. On a brief visit to the Cape of Good Hope Pearson met with two species of Inocybe, one European and one endemic.

Recognised Species.—The reader will note some differences between the names of species described below and those printed in the list of British Agarics and Boleti, 1948. A few changes are merely matters of synonymy. Several species recently distinguished by continental authors have been added, mainly in the Goniosporae. *Inocybe vatricosa* has been deleted because, whatever the status of Fries' fungus, the British collections so named by Berkeley are not Inocybes. *I. whitei*, reduced in the list to synonymy with *I. vatricosa* following its treatment in Heim's index, has been reinstated though it is not well enough known to key out satisfactorily. Examination of the type at Kew has shown it to be a member of the Muriculatae with exceptionally broad short cystidia and small rather pointed spores. The type was from Rannoch, Perthshire, and one may hope it will be recollected and studied afresh. *I. fasciata* has been left out because it may have been an alien and as the type has not been preserved for checking of the microscopic features it is hardly possible to assign it a place in so criticial a group as the Goniosporae.

Because of the difficulty in accurately expressing the physiognomy of these rather monotonous fungi in words, a list of approved coloured figures has been included in the tables. Wherever possible these are cited from the standard iconographies of Lange (L), and Bresadola (B), supplemented where necessary by those of Konrad and Maublanc and of Heim. The works in question are as follows:

Bresadola, J. (1930). *Iconographia mycologica*, fascicles 15 and 16, Milan.
Heim, R. (1931). *Le Genre Inocybe, Encyclopédie mycologique*, Tome I, Paris.
Konrad, P., and Maublanc, A. (1924-1930). *Icones selectae Fungorum*, Tome I, Paris.
Lange, J. E. (1938), (1940). *Flora Agaricina Danica*, Vol. 3 and Vol. 5, Copenhagen.
Møller, F. H. (1945). *Fungi of the Faroes*, Part 1, Copenhagen.

Key to British Species of Inocybe

Spore outline even, bean-shaped, almond-shaped or ovate . . . 1
Spores nodulose with ± prominent bosses 35
Spores subglobose with numerous short cylindrical spines *I. calospora* (65)

1. Gill edge fringed with thickwalled fusoid-ventricose cystidia, often crested with crystals, spore-shape varies 11
Gill edge without such cystidia but composed of thinwalled, cylindrical, clavate or pyriform cells (paracystidia), spores bean-shaped . . 2

2. Cap, and often stem, rough (squarrose) with pointed scales . . . 3
Not so, stem not distinctly scaly 4

3. Stem squarrose, base bluish green . . . *calamistrata* (5)
Stem fibrillose, base not blue-green . . . . *hirsuta* (6)

4. Smell strong of ripe pears, flesh stains red . . . *bongardii* (3)
Smell strong but musty, flesh stains red . . . *cervicolor* (4)
No such distinctive smell 5

5. Cap stains red 6
Not so 7

6. White cap stains light red or brick colour . . *patouillardii* (2)
Cap with dark fibrils, stains dingy red or wine-purple . . *jurana* (1)
Cap olive-buff with reddish patches . . . . *squamata* (7)

7. Cap convex or flat, not rimose 8
Cap conico-campanulate, distinctly rimose, i.e. radiately fibrillose . . 9

8. Cap tawny, densely scaly, gill edge with septate cells . *dulcamara* (13)
Cap reddish-brown, papillate, gill edge with nonseptate clavate cells *perbrevis* (12)

9. Stem with a marginate bulb at the base . . . . *cookei* (10)
Stem without a distinct marginate bulb 10

10. Cap straw yellow when quite fresh . . . . *fastigiata* (8)
Cap chestnut brown, at first with a whitish veil which may persist in small patches . . . . . *maculata* (9)
Cap ochre with dark streaks, a large species with abruptly incurved margin *perlata* (11)
Cap olive-buff . . . . . *squamata* (7)

11. Cap white at first 12
Cap coloured from the start 17

12. Cap with a greenish umbo, strong smell of ripe pears . *corydalina* (17)
Cap stains red in patches 13
Cap not staining red 14

13. Stem with a marginate bulb . . . . . *godeyi* (15)
Stem only slightly swollen at the base . . . . . *pudica* (16)

14. Cap glabrous with innate silky fibrils, small, very common *geophylla* (14)
Cap covered with arachnoid fibrils, turns rusty-brown, spores cylindrical, occurs on sand dunes . . . . . *serotina* (18)
Not as either of the above 15

15. Gills distant, cap silvery white . . . . *sambucina* (19)
Gills crowded, cap not permanently white 16

16. Cap white flushed with yellow and with darker concentric scales *mutica* (20)
Cap with a white veil, said to be viscid at first, then ochraceous-tawny *whitei* (28)

17. Cap dingy olive-green, flesh turning red . . . *haemacta* (21)
Cap large, reddish, with smell of ripe pears . *pyriodora v. incarnata* (22a)
Not as above but with lilaceous tints on cap or stem, at least at the apex 18
With neither green, reddish nor violaceous tints 19

18. Cap tomentose, blue or lavender . *griseolilacina* (29) and *pusio* (30)
(These may be no more than the larger and smaller forms of one species)
Cap smooth, lilac, usually small . . . *geophylla v. lilacina* (14a)
Cap with erect scales, especially on the disc, purple on the stem *cincinnata* (41)

19. Cap with some yellowish hue (buff, ochre or yellow) 20
Cap brownish 24

20. Smell strong of ripe pears . . . . . *pyriodora* (22)
No smell of pears 21

21. Flesh smells of new meal 22
Smell different or not distinctive 23

Species	Cap	Gills	Stem
I. LEIOSPORAE Spore outline smooth (Spp. 1-41)			
(*a*) **Depauperatae** Cystidia thinwalled with rounded ends (Spp. 1-13)			
1. **Rubescentes** Some part turning red.			
1. *jurana* (Pat.) Sacc.	2-6 cm., conical, umbo blunt or acute, buff with darker fibrils, soon dingy red, especially on umbro, sometimes dark wine-purple.	Crowded, linear or ventricose, adnate then free, white then cloudy olive or olive-brown, edge white, fimbriate.	3-6 cm. long, 3-10 mm. white or flushed pink reddish striate silky sometimes squamulos
2. *patouillardii* Bres.	3-8 cm., conical or campanulate, white then ivory, radiating fibrils stain blood-red, margin often lobed and split with arachnoid veil visible under lens.	Crowded, narrow, linear and ventricose, white then olive-brown, stain red when rubbed, edge white floccose	4-10 cm. by 1-2 cm., u stout, firm, white flushed with red, fibr striate, equal or w marginate bulb.
3. *bongardii* (Weinm.) Quél.	3-6 cm., campanulate, pale cinnamon, flushed pink and with darker scales.	Subcrowded, broad, ventricose, olive-cinnamon, edge white-floccose.	5-10 cm. by 5-10 mm., u tall, equal, hard, cinnamon, fibrillose, and pruinose above.
4. *cervicolor* (Pers. ex Secretan) Karst.	2-5 cm., gibbous or campanulate, fawn with darker recurved squamules, especially on disc, margin fibrillose.	Subdistant, broad, ventricose, adnate, dingy cream then rust-brown with reddish spots; edge white, denticulate.	4-10 cm. by 4-6 mm., light brown, fibr white-pruinose above.
5. *calamistrata* (Fr.) Gillet	1-5 cm., convex or campanulate, dark brown with erect pointed scales, especially dense on disc.	Crowded, narrow, adnate, whitish then rusty-brown, edge white, fimbriate.	3-7 cm. by 5-10 mm., sub- base thickened or act ate; dark brown with s rose scales, apex paler with blue-green tomen
6. *hirsuta* (Lasch) Quél.	2-4½ cm., campanulate, reddish or dark brown, with pointed recurved scales.	Crowded, broad, ventricose, adnexed or free, whitish then straw coloured, edge white, eroded.	6-10 cm. by 4-5 mm., us tall and slender, brown with recurved lose scales, apex flocculose, base simila
7. *squamata* Lange	3-10 cm., campanulate, olive-buff with reddish patches, tomentose with an arachnoid veil.	Crowded, ventricose, adnate, emarginate, old gold then olive-brown, edge white, fimbriate.	3-7 cm. by 5-10 mm., equ subbulbous, olive-buff reddish ochre, stria fibrillosely scaly, base w tomentose.
2. **Rimosae.** Cap with radiating fibrils. Often cracking.			
8. *fastigiata* (Schaeff. ex Fr.) Quél.	3-10 cm., conic-campanulate with acute or obtuse umbo, straw-yellow then browner, smooth, rimose, often split.	Crowded, narrow, linear or ventricose, adnate or adnexed, yellow then olive with white edge.	4-10 cm. by 5-15 mm., e pallid then brown, losely striate, apex w pruinose.
9. *maculata* Boud.	2-8 cm., conic-campanulate, umbo often acute, bay or chestnut, silky, cracking radially showing pale flesh first clothed with dense white veil, often persistent on umbo or in patches.	Crowded, narrow, linear, adnate-emarginate, whitish then snuff-brown, edge white-fimbriate.	4-9 cm. by 5-12 mm., e white then brown, f losely striate, base equ subbulbous.

Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
, flushed pink, cially in cap base of stem; ıy line above .	Mild, rancid; smell of new meal.	Snuff-brown, bean-shaped, smooth, 10-15 × 5-7μ	Clavate thinwalled, 10-18μ wide.	L 117E & F B 724	Coniferous and deciduous woods, e.g. beech, uncommon but sometimes in large numbers.
, unchanging.	Mild, smell faint or strong, not mealy but not unpleasant.	Bister, bean-shaped, smooth, 10-13 × 5½-7μ	Subcylindric or clavate, thinwalled, 8-10μ wide below, 12-15μ at the apex.	L 115E B 749	Deciduous woods, especially beech, not uncommon in troops in summer. **Very poisonous.**
staining red finally red- -buff.	Taste mild; smell strong of ripe pears.	Snuff-brown, bean-shaped, smooth, 10-12 × 6-7μ	Subcylindric or clavate, thinwalled, 10-14μ wide.	L 114E	Coniferous and deciduous woods, uncommon.
stains red.	Taste slightly bitter; smell unpleasant, musty.	Snuff-brown bean-shaped to subamygdaloid, smooth, 11-14 × 6-7½μ	Cylindrical or subventricose, thinwalled.	L 114F	Coniferous woods, uncommon.
turning red, h-green at base.	Mild; smell faint, pleasant.	Snuff-brown bean-shaped smooth, 9-11 × 4½-5½μ	Claviform, almost balloon-shaped, 8-12μ wide, thinwalled.	L 114D (poor) B 721(2)	Mostly coniferous woods, uncommon.
, turning red.	Slightly bitter; smell strong.	Snuff-brown, ellipsoid, smooth, 11-13 × 5-7μ	Somewhat clavate, 40-60 × 12-20μ	K & M 90	Coniferous woods.
to clive-buff a horny line e gills, pith .	Mild; inodorous.	Snuff-brown, smooth, elliptical to sub-bean-shaped, 8½-9½ × 5-5½μ	Cylindrical or sack-shaped, thinwalled.	L 115D	Damp woods, rare.
	Mild with slight bitter aftertaste; smell faint, mealy.	Snuff-brown, smooth, bean-shaped, 9-12 × 4½-7μ in typical form, larger in others.	Cylindrical to clavate thinwalled.	L 114B B 744	Typical form is common in beech woods, less common and variable elsewhere.
	Mild; smell slight at first, like truffles when drying.	Snuff-brown smooth, bean-shaped, 9-11 × 4½-5½μ	Clavate, thinwalled.	L 116E	Deciduous woods, especially beech, common.

Species	Cap	Gills	Stem	Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
I. **LEIOSPORAE** Spore outline smooth (Spp. 1-41)									
(*a*) **Depauperatae** Cystidia thinwalled with rounded ends (Spp. 1-13)									
1. **Rubescentes** Some part turning red.									
1. *jurana* (Pat.) Sacc.	2-6 cm., conical, umbo blunt or acute, buff with darker fibrils, soon dingy red, especially on umbro, sometimes dark wine-purple.	Crowded, linear or ventricose, adnate then free, white then cloudy olive or olive-brown, edge white, fimbriate.	3-6 cm. long, 3-10 mm. th white or flushed pink reddish striate silky fib sometimes squamulose	ushed pink, ually in cap se of stem; e line above	Mild, rancid; smell of new meal.	Snuff-brown, bean-shaped, smooth, 10-15 × 5-7 μ	Clavate thinwalled, 10-18 μ wide.	L 117E & F B 724	Coniferous and deciduous woods, e.g. beech, uncommon but sometimes in large numbers.
2. *patouillardii* Bres.	3-8 cm., conical or campanulate, white then ivory, radiating fibrils stain blood-red, margin often lobed and split with arachnoid veil visible under lens.	Crowded, narrow, linear and ventricose, white then olive-brown, stain red when rubbed, edge white floccose	4-10 cm. by 1-2 cm., tap stout, firm, white flushed with red, fibril striate, equal or wit marginate bulb.	nchanging.	Mild, smell faint or strong, not mealy but not unpleasant.	Bister, bean-shaped, smooth, 10-13 × 5½-7 μ	Subcylindric or clavate, thinwalled, 8-10 μ wide below, 12-15 μ at the apex.	L 115E B 749	Deciduous woods, especially beech, not uncommon in troops in summer. **Very poisonous.**
3. *bongardii* (Weinm.) Quél.	3-6 cm., campanulate, pale cinnamon, flushed pink and with darker scales.	Subcrowded, broad, ventricose, olive-cinnamon, edge white-floccose.	5-10 cm. by 5-10 mm., usu tall, equal, hard, cinnamon, fibrillose, and pruinose above.	turning red ually red- ish.	Taste mild; smell strong of ripe pears.	Snuff-brown, bean-shaped, smooth, 10-12 × 6-7 μ	Subcylindric or clavate, thinwalled, 10-14 μ wide.	L 114E	Coniferous and deciduous woods, uncommon.
4. *cervicalar* (Pers. ex Secretan) Karst.	2-5 cm., gibbous or campanulate, fawn with darker recurved squamules, especially on disc, margin fibrillose.	Subdistant, broad, ventricose, adnate, dingy cream then rust-brown with reddish spots; edge white, denticulate.	4-10 cm. by 4-6 mm., eq light brown, fibril white-pruinose above.	ains red.	Taste slightly bitter; smell unpleasant, musty.	Snuff-brown bean-shaped to subamygdaloid, smooth, 11-14 × 6-7½ μ	Cylindrical or subventricose, thinwalled.	L 114F	Coniferous woods, uncommon.
5. *calamistrata* (Fr.) Gillet	1-5 cm., convex or campanulate, dark brown with erect pointed scales, especially dense on disc.	Crowded, narrow, adnate, whitish then rusty-brown, edge white, fimbriate.	3-7 cm. by 5-10 mm., sub-eq base thickened or acut ate; dark brown with sq rose scales, apex paler, with blue-green tomento	rning red, green at ge.	Mild; smell faint, pleasant.	Snuff-brown bean-shaped smooth, 9-11 × 4½-5½ μ	Claviform, almost balloon-shaped, 8-12 μ wide, thinwalled.	L 114D (poor) B 721(2)	Mostly coniferous woods, uncommon.
6. *hirsuta* (Lasch) Quél.	2-4½ cm., campanulate, reddish or dark brown, with pointed recurved scales.	Crowded, broad, ventricose, adnexed or free, whitish then straw coloured, edge white, eroded.	6-10 cm. by 4-5 mm., usu tall and slender, eq brown with recurved fi lose scales, apex w flocculose, base similar	turning red.	Slightly bitter; smell strong.	Snuff-brown, ellipsoid, smooth, 11-13 × 5-7 μ	Somewhat clavate, 40-60 × 12-20 μ	K & M 90	Coniferous woods.
7. *squamata* Lange	3-10 cm., campanulate, olive-buff with reddish patches, tomentose with an arachnoid veil.	Crowded, ventricose, adnate, emarginate, old gold then olive-brown, edge white, fimbriate.	3-7 cm. by 5-10 mm., equ subbulbous, olive-buff t reddish ochre, striat fibrillosely scaly, base wh tomentose.	live buff horny line gills, pith	Mild; inodorous.	Snuff-brown, smooth, elliptical to sub-bean-shaped, 8½-9½ × 5-5½ μ	Cylindrical or sack-shaped, thinwalled.	L 115D	Damp woods, rare.
2. **Rimosae**. Cap with radiating fibrils. Often cracking.									
8. *fastigiata* (Schaeff. ex Fr.) Quél.	3-10 cm., conic-campanulate with acute or obtuse umbo, straw-yellow then browner, smooth, rimose, often split.	Crowded, narrow, linear or ventricose, adnate or adnexed, yellow then olive with white edge.	4-10 cm. by 5-15 mm., eq pallid then brown, fi losely striate, apex wh pruinose.		Mild with slight bitter aftertaste; smell faint, mealy.	Snuff-brown, smooth, bean-shaped, 9-12 × 4½-7 μ in typical form, larger in others.	Cylindrical to clavate thinwalled.	L 114B B 744	Typical form is common in beech woods, less common and variable elsewhere.
9. *maculata* Boud.	2-8 cm., conic-campanulate, umbo often acute, bay or chestnut, silky, cracking radially showing pale flesh first clothed with dense white veil, often persistent on umbo or in patches.	Crowded, narrow, linear, adnate-emarginate, whitish then snuff-brown, edge white-fimbriate.	4-9 cm. by 5-12 mm., eq white then brown, fib losely striate, base equal subbulbous.		Mild; smell slight at first, like truffles when drying.	Snuff-brown smooth, bean-shaped, 9-11 × 4½-5½ μ	Clavate, thinwalled.	L 116E	Deciduous woods, especially beech, common.

Species	Cap	Gills	Stem
10. *cookei* Bres.	3-5 cm., conic-campanulate, pale ochre, silky-fibrillose then rimose, disc smooth.	Crowded, narrow, linear, adnexed, whitish then cinnamon.	3-6 cm. by 3-5 mm., down to the marginat flushed with ochre, whitish.
11. *perlata* (Cooke) Sacc.	6-10 cm., usually large, campanulate with obtuse umbo, ochraceous with darker radiating streaks, margin abruptly incurved.	Crowded, rather broad, whitish then cinnamon, edge white, eroded.	6-11 cm. by 1-1½ cm., then brown, innately losely striate, equal.
3. **Atypicae.**			
12. *perbrevis* (Weinm.) Gillet *sensu* Cooke	1-2 cm., convex then flat or depressed round obtuse central papilla, silky-tomentose with concentric scales, olive-yellow then dark rusty brown, drying buff, margin fibrillose often splitting.	Sub-crowded, linear, narrow, adnate with decurrent tooth, pale clay then darker, edge white, fimbriate.	1-2 cm. by 2-4 mm., ta downward, sometime small basal bulb, r buff with scattered
13. *dulcamara* (Alb. & Schw. ex Fr.) Kummer	1-4 cm., convex or flat with or without umbo, ochraceous or tawny with slight olive tint, densely tomentose with erect or adpressed scales; arachnoid veil on margin.	Crowded, narrow, linear or broad and ventricose, adnate, pallid then brown, edge white, fimbriate.	3-4 cm. by 2-6 mm., sul colour of cap, apex fibrillosely striate scattered squamules, noid veil may f floccose ring
(*b*) **Muriculatae.** With thickwalled cystidia, usually ti pped by crystals. (Spp. 14-41)			
1. **Albidae.** Cap whi te or whitish, exceptionally lil ac, sometimes flushed with red. (See also *descissa*.)			
14. *geophylla* (Sow. ex Fr.) Kummer	1-3 cm., conical, umbo acute or obtuse, silky-fibrillose, white or tinged faint yellow.	Crowded, narrow, adnexed, cream then clay colour.	1-6 cm. by 2-4 mm., white, silky-fibrillose
14a. var. *lilacina* (Fr.) Karst.	Lilac, often with yellowish umbo.	clay colour.	lilac, base ochraceous.
15. *godeyi* Gillet	3-5 cm., conical, obtuse, silky-fibrillose, white or cream turning bright red or ochraceous.	Crowded, adnexed, whitish then cinnamon with olive tint, edge white, floccose.	4-6 cm. by 3-5 mm., eq with marginate b base, fibrillose, whi reddened.
16. *pudica* Kühner	2-5 cm., campanulate, smooth with innate fibrils, white staining pink in patches or brownish on the umbo.	Subcrowded, ventricose, adnexed, white with red stains, then smoky and finally snuff-brown.	4-10 cm. by 5-7 mm slightly swollen, staining red in plac
17. *corydalina* Quél.	4-8 cm., campanulate then flat with prominent obtuse umbo, dingy white with darker streaks and greenish umbo.	Crowded, broad, linear, adnate-emarginate, whitish then brown, edge white, fimbriate.	4-8 cm. by 7-10 mm. or swollen at base, or slightly greenish fibrillosely striate.

Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
sh then straw-ow.	Mild; smell pleasant.	Snuff-brown, smooth, bean-shaped, 7-8 × 4-5μ	Pyriform, 10-20μ wide.	L 114A	Deciduous woods, fairly common.
then brown-		Snuff-brown, smooth, elliptical, 9½-12 × 6-7½μ	Cylindric-clavate, 10-11μ wide.	L 115F	Roadsides on damp clay, not common.
or reddish	Mild; inodorous.	Obovate or bean-shaped, smooth, mostly 9-10 × 5-6μ according to Heim.	Clavate, in tufts on the gill edge.	Heim 5 (2)	Woods or sandy places, rare, further observations needed to confirm its status.
uff with horny over gills.	Taste mild or a trace of bitterness; inodorous.	Snuff-brown, smooth, bean-shaped, 7½-10½ × 5-5½μ	Gill edge sterile with short clavate, or pyriform, thinwalled, septate hairs, 10-20μ wide.	L 114C B 722	Roadsides, margins of woods and sandy places, fairly common.
	Mild; smell earthy.	Snuff-brown, smooth, subamygdaloid, 8-10½ × 5-6μ	Fusoid-ventricose, crested, 40-70 × 14-20μ	L 112E, far left only. B 752 centre.	Very common in woods of all kinds.
ous.		7-10 × 5½-6μ	35-60 × 14-20μ	L 112G B 752 part.	Common in deciduous woods.
, surface red-ng.	Acrid; smell strong but variable, earthy or mealy.	Snuff-brown, smooth, amygdaloid, 9-11½ × 5-7μ	Broadly ventricose to pyriform, 40-80 × 13-21μ	L 112C Slender state.	Rather common, mostly in deciduous woods.
blushing tly or more l red in pith em.	Mild then rancid; smell of new meal.	Snuff-brown, smooth, almost bean-shaped with short apiculus, 8-9 × 4½-5½μ	Fusoid with long or short neck, 40-60 × 14-20μ mixed with thinwalled pyriform cells.	L 112H ?L 112E except extreme left.	Coniferous woods, uncommon.
, yellowing tly with age.	Mild; smell strong of ripe pears.	Snuff-brown, smooth, ellipsoid, 8-10 × 5-6½μ	Fusoid to ventricose, 35-55 × 12-18μ mostly marginal.	B 739	Coniferous woods, uncommon.

Species	Cap	Gills	Stem
10. *caakei* Bres.	3-5 cm., conic-campanulate, pale ochre, silky-fibrillose then rimose, disc smooth.	Crowded, narrow, linear, adnexed, whitish then cinnamon.	3-6 cm. by 3-5 mm., down to the marginate flushed with ochre, whitish.
11. *perlata* (Cooke) Sacc.	6-10 cm., usually large, campanulate with obtuse umbo, ochraceous with darker radiating streaks, margin abruptly incurved.	Crowded, rather broad, whitish then cinnamon, edge white, eroded.	6-11 cm. by 1-1½ cm., then brown, innately losely striate, equal.
3. **Atypicae.**			
12. *perbrevis* (Weinm.) Gillet *sensu* Cooke	1-2 cm., convex then flat or depressed round obtuse central papilla, silky-tomentose with concentric scales, olive-yellow then dark rusty brown, drying buff, margin fibrillose often splitting.	Sub-crowded, linear, narrow, adnate with decurrent tooth, pale clay then darker, edge white, fimbriate.	1-2 cm. by 2-4 mm., tap downward, sometimes small basal bulb, red buff with scattered s
13. *dulcamara* (Alb. & Schw. ex Fr.) Kummer	1-4 cm., convex or flat with or without umbo, ochraceous or tawny with slight olive tint, densely tomentose with erect or adpressed scales; arachnoid veil on margin.	Crowded, narrow, linear or broad and ventricose, adnate, pallid then brown, edge white, fimbriate.	3-4 cm. by 2-6 mm., sub colour of cap, apex fibrillosely striate scattered squamules, noid veil may for floccose ring
(*b*) **Muriculatae.** With thickwalled cystidia, usually tipped by crystals. (Spp. 14-41)			
1. **Albidae.** Cap wh	te or whitish, exceptionally lil	ac, sometimes flushed with red.	(See also *descissa*.)
14. *geophylla* (Sow. ex Fr.) Kummer	1-3 cm., conical, umbo acute or obtuse, silky-fibrillose, white or tinged faint yellow.	Crowded, narrow, adnexed, cream then clay colour.	1-6 cm. by 2-4 mm., white, silky-fibrillose.
14a. var. *lilacina* (Fr.) Karst.	Lilac, often with yellowish umbo.	clay colour.	lilac, base ochraceous.
15. *gadeyi* Gillet	3-5 cm., conical, obtuse, silky-fibrillose, white or cream turning bright red or ochraceous.	Crowded, adnexed, whitish then cinnamon with olive tint, edge white, floccose.	4-6 cm. by 3-5 mm., equ with marginate bul base, fibrillose, white reddened.
16. *pudica* Kühner	2-5 cm., campanulate, smooth with innate fibrils, white staining pink in patches or brownish on the umbo.	Subcrowded, ventricose, adnexed, white with red stains, then smoky and finally snuff-brown.	4-10 cm. by 5-7 mm slightly swollen, staining red in plac
17. *carydalina* Quél.	4-8 cm., campanulate then flat with prominent obtuse umbo, dingy white with darker streaks and greenish umbo.	Crowded, broad, linear, adnate-emarginate, whitish then brown, edge white, fimbriate.	4-8 cm. by 7-10 mm or swollen at base, or slightly greenish fibrillosely striate.

...esh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
...then straw-	Mild; smell pleasant.	Snuff-brown, smooth, bean-shaped, 7·8 × 4·5μ	Pyriform, 10-20μ wide.	L 114A	Deciduous woods, fairly common.
...en brown-		Snuff-brown, smooth, elliptical, 9½-12 × 6·7½μ	Cylindric-clavate, 10-11μ wide.	L 115F	Roadsides on damp clay, not common.
...e reddish	Mild; inodorous.	Obovate or bean-shaped, smooth, mostly 9-10 × 5-6μ according to Heim.	Clavate, in tufts on the gill edge.	Heim 5 (2)	Woods or sandy places, rare, further observations needed to confirm its status.
...with horny ...n gills.	Taste mild or a trace of bitterness; inodorous.	Snuff-brown, smooth, bean-shaped, 7½-10½ × 5·5½μ	Gill edge sterile with short clavate, or pyriform, thinwalled, septate hairs, 10-20μ wide.	L 114C B 722	Roadsides, margins of woods and sandy places, fairly common.
	Mild; smell earthy.	Snuff-brown, smooth, subamygdaloid, 8·10½ × 5·6μ	Fusoid-ventricose, crested, 40-70 × 14·20μ	L 112E, far left only. B 752 centre.	Very common in woods of all kinds.
...e		7·10 × 5½·6μ	35·60 × 14·20μ	L 112G B 752 part.	Common in deciduous woods.
...rface red-	Acrid; smell strong but variable, earthy or mealy.	Snuff-brown, smooth, amygdaloid, 9-11½ × 5·7μ	Broadly ventricose to pyriform, 40-80 × 13-21μ	L 112C Slender state.	Rather common, mostly in deciduous woods.
...blushing ...or more ...red in path ...en.	Mild then rancid; smell of new meal.	Snuff-brown, smooth, almost bean-shaped with short apiculus, 8·9 · 4½·5½μ	Fusoid with long or short neck, 40-60 × 14-20μ mixed with thinwalled pyriform cells.	L 112H ?L 112E except extreme left.	Coniferous woods, uncommon.
...yellowing ...ly with age.	Mild; smell strong of ripe pears.	Snuff-brown, smooth, ellipsoid, 8-10 × 5-6½μ	Fusoid to ventricose, 35-55 × 12-18μ mostly marginal.	B 739	Coniferous woods, uncommon.

Species	Cap	Gills	Stem
18. ***serotina*** Peck	1-8 cm., convex or gibbous, rimose with arachnoid fibrils, white, turning ochre or rusty brown.	Crowded, adnexed, linear or ventricose, white then snuff-brown with trace of olive, edge white, fimbriate.	3-10 cm. by 3-10 mm., equal, firm, base with a marginate bulb.
19. ***sambucina*** (Fr.) Quél.	4-8 cm., fleshy, stout, convex or broadly umbonate, silvery white or cream, then dingy yellow.	Distant, ventricose, rather broad, adnexed, cream then ochraceous-buff.	2½-4 cm. by 1-2 cm., equ slightly bulbous, fibrill striate, white, solid.
20. ***mutica*** (Fr.) Karst. *sensu* Cooke	2½-5 cm., campanulate, obtuse, whitish or flushed with yellow and with darker concentric scales.	Crowded, linear or ventricose, adnexed, white then brown.	3-6 cm. by 5-8 mm., bulbous, white above, below, fibrillose.
2. **Viridae** Cap gree	nish, squamulose. (But see al	so *corydalina*.)	
21. ***haemacta*** (Berk. & Cke.) Sacc.	2-4 cm., gibbous, scaly with dingy olive-green squamules, somewhat silvery at margin, almost black on umbo.	Crowded, arcuate, linear or ventricose, adnexed, cloudy brown, edge white, fimbriate.	3-6 cm. by 4-9 mm., down to a marginate apex white-fibrillose, mainder with dense green squamules, redd in patches; bulb w tomentose.
3. **Ochraceae.** Cap	ochraceous.		
22. ***pyriodora*** (Pers. ex Fr.) Kummer	4-8 cm., gibbous or campanulate, pale ochraceous with reddish-brown tints, fibrillosely scaly, margin often split.	Crowded, ventricose, adnate, whitish then cinnamon, edge white, fimbriate.	5-10 cm. by ½-1½ cm., pruinose above, fibr and concolorous with cap below.
22a. var. ***incarnata*** (Bres.) R. Maire	Differs in the redder tint.		
23. ***eutheles*** (B. & Br.) Sacc.	2-5 cm., campanulate with prominent umbo, pale fawn, rimose, tomentose, margin paler, often appendiculate with the veil.	Crowded, ventricose, emarginate with a tooth, whitish then clay colour, edge white, fimbriate.	5-7 cm. by 5-10 mm., wh sometimes tinted flesh our at first above, sli enlarged downwards, p ose throughout.
24. ***lucifuga*** (Fr. ex Fr.) Kummer	1-4 cm., gibbous or campanulate, pale ochraceous with olive tint, silky fibrillose and covered with small darker adpressed scales, closest at the disc.	Crowded, ventricose or linear, adnexed, cream then olive-brown, edge white-floccose.	3-4 cm. by 3-5 mm. e white.
25. ***hirtella*** Bres.	1-2½ cm., conico-campanulate, straw-yellow, umbo darker, covered with small, darker, adpressed scales.	Crowded, linear, adnexed, straw colour then brown.	2-4 cm. by 1½-4 mm., al with a small bulb imm in the soil.

Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
e.	Mild; smell none or musty.	Snuff-brown, smooth, cylindrical, 12-19 × 5-7μ	Mostly balloon-shaped and not crested, 40-70 × 10-20μ on edge and face of gill.	L 111I	Sand dunes, uncommon.
e.	Smell strong.	Amygdaloid, smooth, 9-12 × 5-6μ	Fusoid, slender, crested, 50-60 × 12-16μ abundant on gill edge, scattered on face.	B 750 Fries *Icones*, 109(2)	Rare and not well known.
e.	Not recorded.	Elongate-amygdaloid, smooth, 7½-10½ × 4½-5½μ according to Heim.	Elongate-fusoid, slender, 70-80 × 12-16μ according to Heim.	Fries *Icones*, 109(1) Cooke 418 (382)	Woods and roadsides, rare. A doubtful species.
t and white th greenish tint cap, horny line er gills, darker en and blotch- with red in m; finally suf- ed with red oughout.	Mild; inodorous.	Snuff-brown, smooth, amygdaloid, 8-10 × 5-5½μ	Slender flask-shaped with long neck, crested or not, tinged with yellow, 75-100 × 12-25μ	L 112B	Uncommon, described from a troop under limes on chalk.
te, turning kish or reddish f.	Mild; smell strong of over-ripe pears.	Snuff-brown, smooth, amygdaloid, 8-11½ × 5-7μ	On edge and face of gill, ventricose, obtuse, crested, 50-75 × 12-15μ among clavate paracystidia on the edge.	L 110B	Woods of all kinds, common.
e.	Mild; smell faintly earthy.	Snuff-brown, smooth, amygdaloid, 8½-10 × 4-5μ	Fusiform thick-walled, scarcely crested, on gill edge and face, 60-75 × 13-15μ often yellowish.	L 112F B 727	Pine woods, very common.
te, faintly hed with red.	Smell strong, unpleasant, earthy or of radish.	Ellipsoid, smooth, 7½-13 × 4½-7μ according to Heim.	Slender fusoid, crested, 50-70 × 12-18μ mixed with pyriform thinwalled paracystidia.		Coniferous woods.
with a slight yish tint.	Mild; smell of almonds.	Subamygdaloid, 9-12 × 5-6μ	As above.	L 113G B 734	Chiefly under hazel but not yet recognised in Britain. May be a variety of *lucifuga*.

Species	Cap	Gills	Stem	Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
18. *seratina* Peck	1-8 cm., convex or gibbous, rimose with araebnoid fibrils, white, turning ochre or rusty brown.	Crowded, adnexed, linear or ventricose, white then snuff-brown with trace of olive, edge white, fimbriate.	3-10 cm. by 3-10 mm., equal, firm, base with a marginate bulb.		Mild; smell none or musty.	Snuff-brown, smooth, cylindrical, 12-10 × 5-7μ	Mostly balloon-shaped and not crested, 40-70 × 10-20μ on edge and face of gill.	L 111I	Sand dunes, uncommon.
19. *sambucina* (Fr.) Quél.	4-8 cm., fleshy, stout, convex or broadly umbonate, silvery white or cream, then dingy yellow.	Distant, ventricose, rather broad, adnexed, cream then ochraceous-buff.	2½-4 cm. by 1-2 cm., equal slightly bulbous, fibrillose striate, white, solid.		Smell strong.	Amygdaloid, smooth, 0-12 × 5-6μ	Fusoid, slender, crested, 50-60 × 12-16μ abundant on gill edge, scattered on face.	B 750 Fries *Icones*, 109(2)	Rare and not well known.
20. *mutica* (Fr.) Karst. *sensu* Cooke	2½-5 cm., campanulate, obtuse, whitish or flusbed with yellow and with darker concentric scales.	Crowded, linear or ventricose, adnexed, white then brown.	3-6 cm. by 5-8 mm., bulbous, white above, below, fibrillose.		Not recorded.	Elongate-amygdaloid, smooth, 7½-10½ × 4½-5½μ according to Heim.	Elongate-fusoid, slender, 70-80 × 12-16μ according to Heim.	Fries *Icones*, 109(1) Cooke 418 (382)	Woods and roadsides, rare. A doubtful species.
2. **Viridae** Cap gree	nisb, squamulose. (But see al	so *corydalina*.)							
21. *haemacta* (Berk. & Cke.) Sacc.	2-4 cm., gibbous, scaly with dingy olive-green squamules, somewbat silvery at margin, almost black on umbo.	Crowded, arcuate, linear or ventricose, adnexed, cloudy brown, edge white, fimbriate.	3-6 cm. by 4-0 mm., down to a marginate apex white-fibrillose, mainder with dense green squamules, redde in patches; bulb w tomentose.	and wbite greenish tint y, horny line gills, darker s and blotch- mb red in , finally suf- with red ghout.	Mild; inodorous.	Snuff-brown, smooth, amygdaloid, 8-10 × 5-5½μ	Slender flask-shaped with long neck, crested or not, tinged with yellow, 75-100 × 12-25μ	L 112B	Uncommon, described from a troop under limes on chalk.
3. **Ochraceae**. Cap	ochraceous.								
22. *pyriadara* (Pers. ex Fr.) Kummer	4-8 cm., gibbous or campanulate, pale ochraceous with reddisb-brown tints, fibrillosely sealy, margin often split.	Crowded, ventricose, adnate, whitish then cinnamon, edge white, fimbriate.	5-10 cm. by ½-1½ cm., pruinose above, fibri and concolorous with cap below.	turning or reddish	Mild; smell strong of over-ripe pears.	Snuff-brown, smooth, amygdaloid, 8-11½ × 5-7μ	On edge and face of gill, ventricose, obtuse, crested, 50-75 × 12-15μ among elavate paracystidia on the edge.	L 110B	Woods of all kinds, common.
22a. var. *incarnata* (Bres.) R. Maire	Differs in the redder tint.								
23. *eutheles* (B. & Br.) Sacc.	2-5 cm., campanulate with prominent umbo, pale fawn, rimose, tomentose, margin paler, often appendiculate with the veil.	Crowded, ventricose, emarginate with a tooth, whitish then clay colour, edge white, fimbriate.	5-7 cm. by 5-10 mm., sometimes tinted flesh our at first above, slo enlarged downwards, pr ose throughout.		Mild; smell faintly eartby.	Snuff-brown, smooth, amygdaloid, 8½-10 × 4-5μ	Fusiform tbick-walled, scareely crested, on gill edge and face, 60-75 × 13-15μ often yellowish.	L 112F B 727	Pine woods, very common.
24. *lucifuga* (Fr. ex Fr.) Kummer	1-4 cm., gibbous or campanulate, pale ochraceous with olive tint, silky fibrillose and covered with small darker adpressed scales, closest at the disc.	Crowded, ventricose or linear, adnexed, cream then olive-brown, edge white-floccose.	3-4 cm. by 3-5 mm. white.	faintly d with red.	Smell strong, unpleasant, eartby or of radish.	Ellipsoid, smootb, 7½-13 × 4½-7μ according to Heim.	Slender fusoid, crested, 50-70 × 12-18μ mixed with pyriform thinwalled paracystidia.		Coniferous woods.
25. *hirtella* Bres.	1-2½ cm., conico-campanulate, straw-yellow, umbo darker, covered with small, darker, adpressed scales.	Crowded, linear, adnexed, straw colour then brown.	2-4 cm. by 1½-4 mm., with a small bulb imm in the soil.	with a slight sh tint.	Mild; smell of almonds.	Subamygdaloid, 0-12 × 5-6μ	As above.	L 113G B 734	Chiefly underbazel but not yet recognised in Britain. May he a variety of *lucifuga*.

Species	Cap	Gills	Stem
26. *langei* Heim	1-4 cm., convex with shallow umbo, pale buff or with slight pinkish tint, darker with age, innately fibrillose, breaking into tiny scales, margin white.	Subdistant, ventricose, rather broad, adnexed, white then ochraceous with olive tint, edge white, fimbriate.	2-4 cm. by 4-6 mm., equ with a bulbous base, v flushed with pink.
26a. *f. bispora* Lange	As above.	As above.	As above.
27. *auricoma* (Batsch ex Fr.) Lange	1-2 cm., conic-campanulate, pale ochre then bright ochre, rimoso-fibrillose.	Crowded, narrow, linear, adnexed, whitish then cinnamon.	3½-5 cm. by 2 mm., sle base slightly swollen, v or straw coloured, ho
28. *whitei* (B. & Br.) Sacc.	1-3 cm., convex with broad umbo, smooth, ochraceous-tawny, margin white with the veil and said to be somewhat viscid.	Crowded, ventricose, adnexed, whitish then brown.	3-4 cm. by 4-6 mm., sli swollen below, smooth, white above, colorous with cap belo
4. **Lilaceae.** Stalk lil	aceous throughout its length,	fibrillose. (cf. also *geophylla* var	. *lilacina* and *cincinnata*.)
29. *griseolilacina* Lange	1½-2½ cm., conical, umbonate, disc azure blue or lavender, turning brown, shaggy-tomentose.	Crowded or subdistant, ventricose, adnate, white then snuff-brown, edge white, fimbriate.	4-7 cm. by 2½-3 mm., azu lavender, densely clo with whitish fibrils flocci, equal or subbul
30. *pusio* Karst. *sensu* Lange	1½-2 cm., acutely umbonate, cigar-brown, rimosely fibrillose, margin paler.	Pallid.	3-3½ cm. by 1½-3 mm., lilac becoming brov below, equal, fibrillose.
5. **Brunneae.** Pileus	brown, often dark brown.		
31. *hystrix* (Fr.) Karst.	2-4 cm., semiglobate or with obtuse umbo, covered with dark brown (or ochre-brown) pointed erect scales, margin fibrillose.	Crowded, broad, slightly ventricose, adnate, whitish then clay colour, edge white, fimbriate.	5-8 cm. by 5-7 mm., equ thickened towards the brown, with concentri curved scales, apex and naked.
32. *flocculosa* (Berk.) Sacc.	2-4 cm., campanulate, subumbonate, brownish fawn with greyish tomentum, margin fibrillose and paler with an arachnoid veil.	Crowded, rather broad, ventricose, pale fawn then ochraceous.	3-5 cm. by 4-5 mm., sube whitish then flushed br fibrillosely striate, pruinose, base white.
33. *abjecta* Karst.	1-2½ cm., campanulate, umbonate, brownish-fawn, tomentose with whitish fibrils except at the margin.	Crowded, adnexed, pale fawn.	2½-4 cm. by 2-3 mm., yello to brown with wh fibrils, not pruinose.
34. *deglubens* (Fr.) Gillet	2-4 cm., campanulate, soon expanded with low umbo, bay-brown or like milky coffee, rimose then peeling concentrically into large or small recurved scales.	Subdistant, slightly ventricose, adnate, dingy grey then cinnamon brown, edge white, fimbriate.	3-5 cm. by 3-5 mm., e white or flushed with bi apex pruinose.

Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
te or flushed ith pink.	Mild; smell of new meal.	Snuff-brown, smooth, ellipsoid or subamygdaloid, 7-8 × 4-5μ	Short and broadly ventricose, crested, 36-50 × 14-17μ	L 113F	Bare ground or under hedges, uncommon.
		10½-12 × 6μ		L 199C	Under beech.
te.	Mild; inodorous.	Snuff-brown, smooth, subamygdaloid, 9-10½ × 4½-5½μ	Fusoid, 50-70 × 10-12μ mixed with pyriform paracystidia, 10-13μ wide.	L 113B	Deciduous woods, fairly common.
te.	Not recorded.	Subamygdaloid, 7-10 × 4-5μ	Broadly ventricose to subglobose, crested, 40-55 × 16-20μ	Cooke 444A	Not recorded.
re blue, or white cap when old.	Mild; smell strong of new meal or with a hint of Pelargonium.	Snuff-brown, smooth, ellipsoid or subamygdaloid, 8-10 × 5-5½μ	Flask-shaped, size and outline variable, 45-60 × 10-15μ mixed with pyriform paracystidia.	L 113F	Deciduous woods and roadsides, fairly common.
tish with trace lilac in the alk.		As above, 8½-11 × 5-6μ	Fusoid, crested, 60 × 14μ	L 112A	Damp oak woods, doubtfully distinct from the preceding.
tish.	Mild; smell faint.	Subamygdaloid, smooth, 9-11½ × 4½-6½μ	Slender fusoid with long neck, crested, 55-90 × 12-16μ on edge and face of gills.	L 111E	Beech woods, uncommon.
te, reddening ghtly in the alk.	Mild; smell faint, of new meal.	Subamygdaloid, smooth, 8-11 × 4½-5½μ	Slender, fusoid, 45-70 × 10-19μ on edge and face of gills, hyaline.	L 111C	Deciduous woods, especially oak.
wn, paler in the p.	Smell faint.	Subamygdaloid, smooth, 8-10(12) × 4½-5½μ	Ventricose, hyaline, crested.	L 111B	Birch woods, etc.
te in cap, ghtly brown in e stalk.	Mild; inodorous.	Amygdaloid 8-9 × 5-6μ	Long slender, fusoid, on edge and face of gills, 65-75 × 13-19μ mixed with pyriform paracystidia.	L 112D	Coniferous woods, fairly common.

Species	Cap	Gills	Stem	Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
26. ***langei*** Heim	1-4 cm., convex with shallow umbo, pale buff or with slight pinkish tint, darker with age, innately fibrillose, breaking into tiny scales, margin white.	Subdistant, ventricose, rather broad, adnexed, white then ochraceous with olive tint, edge white, fimbriate.	2-4 cm. by 4-6 mm., equal with a bulbous base, white flushed with pink.	or flushed pink.	Mild; smell of new meal.	Snuff-brown, smooth, ellipsoid or subamygdaloid, 7-8 × 4-5μ	Short and broadly ventricose, crested, 36-50 × 14-17μ	L 113F	Bare ground or under hedges, uncommon.
26a. ***f. bispora*** Lange	As above.	As above.	As above.			10½-12 × 6μ		L 199C	Under beech.
27. ***auricama*** (Batsch ex Fr.) Lange	1-2 cm., conic-campanulate, pale ochre then bright ochre, rimoso-fibrillose.	Crowded, narrow, linear, adnexed, whitish then cinnamon.	3½-5 cm. by 2 mm., slend base slightly swollen, or straw coloured, hol		Mild; inodorous.	Snuff-brown, smooth, subamygdaloid, 9-10½ × 4½-5½μ	Fusoid, 50-70 × 10-12μ mixed with pyriform paracystidia, 10-13μ wide.	L 113B	Deciduous woods, fairly common.
28. ***whitei*** (B. & Br.) Sacc.	1-3 cm., convex with broad umbo, smooth, ochraceous-tawny, margin white with the veil and said to be somewhat viscid.	Crowded, ventricose, adnexed, whitish then brown.	3-4 cm. by 4-6 mm., slig swollen below, smooth, white above, colorous with cap below		Not recorded.	Subamygdaloid, 7-10 × 4-5μ	Broadly ventricose to subglobose, crested, 40-55 × 16-20μ	Cooke 444A	Not recorded.
4. **Lilaceae.** Stalk li	aceous throughout its length,	fibrillose. (cf. also *geophylla* var. *lilacina* and *cincinnata*.)							
29. ***grisealilacina*** Lange	1½-2½ cm., conical, umbonate, disc azure blue or lavender, turning brown, shaggy-tomentose.	Crowded or subdistant, ventricose, adnate, white then snuff-brown, edge white, fimbriate.	4-7 cm. by 2½-3 mm., azur lavender, densely clo with whitish fibrils flocci, equal or subbulb	blue, or white cap when old.	Mild; smell strong of new meal or with a hint of Pelargonium.	Snuff-brown, smooth, ellipsoid or subamygdaloid, 8-10 × 5-5½μ	Flask-shaped, size and outline variable, 45-60 × 10-15μ mixed with pyriform paracystidia.	L 113F	Deciduous woods and roadsides, fairly common.
30. ***pusia*** Karst. *sensu* Lange	1½-2 cm., acutely umbonate, cigar-brown, rimosely fibrillose, margin paler.	Pallid.	3-3½ cm. by 1½-3 mm., lilac becoming brow below, equal, fibrillose.	with trace dic in the .		As above, 8½-11 × 5-6μ	Fusoid, crested, 60 × 14μ	L 112A	Damp oak woods, doubtfully distinct from the preceding.
5. **Brunneae.** Pileus	brown, often dark brown.								
31. ***hystrix*** (Fr.) Karst.	2-4 cm., semiglobate or with obtuse umbo, covered with dark brown (or ochre-brown) pointed erect scales, margin fibrillose.	Crowded, broad, slightly ventricose, adnate, whitish then clay colour, edge white, fimbriate.	5-8 cm. by 5-7 mm., equa thickened towards the brown, with concentri curved scales, apex and naked.		Mild; smell faint.	Subamygdaloid, smooth, 9-11½ × 4½-6½μ	Slender fusoid with long neck, crested, 55-90 × 12-16μ on edge and face of gills.	L 111E	Beech woods, uncommon.
32. ***flaccidula*** (Berk.) Sacc.	2-4 cm., campanulate, subumbonate, brownish fawn with greyish tomentum, margin fibrillose and paler with an arachnoid veil.	Crowded, rather broad, ventricose, pale fawn then ochraceous.	3-5 cm. by 4-5 mm., subeq whitish then flushed bro fibrillosely striate, pruinose, base white.	tenderening ally in the ed.	Mild; smell faint, of new meal.	Subamygdaloid, smooth, 8-11 × 4½-5½μ	Slender, fusoid, 45-70 × 10-19μ on edge and face of gills, hyaline.	L 111C	Deciduous woods, especially oak.
33. ***abjecta*** Karst.	1-2½ cm., campanulate, umbonate, brownish-fawn, tomentose with whitish fibrils except at the margin.	Crowded, adnexed, pale fawn.	2½-4 cm. by 2-3 mm., yell to brown with wh fibrils, not pruinose.	paler in the	Smell faint.	Subamygdaloid, smooth, 8-10(12) × 4½-5½μ	Ventricose, hyaline, crested.	L 111B	Birch woods, etc.
34. ***deglubens*** (Fr.) Gillet	2-4 cm., campanulate, soon expanded with low umbo, bay-brown or like milky coffee, rimose then peeling concentrically into large or small recurved scales.	Subdistant, slightly ventricose, adnate, dingy grey then cinnamon brown, edge white, fimbriate.	3-5 cm. by 3-5 mm., white or flushed with br apex pruinose.	in cap, ghtly brown in stalk.	Mild; inodorous.	Amygdaloid 8-9 × 5-6μ	Long slender, fusoid, on edge and face of gills, 65-75 × 13-19μ mixed with pyriform paracystidia.	L 112D	Coniferous woods, fairly common.

Species	Cap	Gills	Stem
35. ***brunnea*** Quél. *sensu* Konrad & Maublanc	2-5 cm., gibbous or campanulate, dark chestnut brown, silky-fibrillose, rarely scaly, margin at first white with the veil.	Crowded, broad, ventricose, whitish then rusty ochre, finally dark brown, edge white, crenulate.	2-5 cm. by 4-5 mm., equa subclavate, often bulb white, buff below, l white, pruinose then fi losely striate.
36. ***lacera*** (Fr.) Quél.	1-3 cm., convex, slightly umbonate, snuff-brown, smooth at first, fibrillose, sometimes breaking into rather ragged concentric scales, margin often split.	Crowded, ventricose or linear, whitish then pinkish-buff, edge white fimbriate.	2-3 cm. by 3-5 mm., slen equal or attenuated dc wards, whitish or buff v brown fibrils.
36a. ***f. subsquarrosa*** Møller	1-2 cm., dark brown at disc, paler elsewhere, adpressedly scaly.	Crowded, adnexed, light ochraceous-brown.	2-5 cm. by 3 mm., eq brown, fibrillose.
37. ***halophila*** Heim	1½-3 cm., semiglobate or umbonate, dark brown, shaggy and clothed with white arachnoid veil.	Deeply ventricose, free, brown with darker edge, often growing beyond margin of cap.	Short, equal or thicker at base, dark brown or p ish, striate with fugac fibrils.
38. ***descissa*** (Fr.) Quél. *sensu* Bresadola	2-3 cm., conico-campanulate with papillate umbo, greyish-white, brown at the disc, silky-fibrillose becoming subsquamulose round the umbo.	White at first then smoky brown, subcrowded, narrow, sinuato-adnexed.	3-5 cm. by 3-4 mm., whit tinged with flesh col equal, hollow, apex pru ose.
38a. ***f. bisporigera*** Lange	Rather darker brown.	Pallid then greyish-brown.	Light brown, solid.
38b. var. ***brunneo-atra*** Heim	1-2 cm., campanulate then flat with papillate umbo, rimose with radiating dark brown fibrils on paler ground, centre blackish.	Crowded, narrow, adnexed or free, greyish-ochre then light brown.	2½-3 cm. by 1½-2½ mm., eq or slightly swollen at base, white at apex, below, becoming hollow even splitting.
39. ***microspora*** Lange	1-2 cm., conic or campanulate with subacute umbo, cigar-brown, umbo darker, tomentosely fibrillose.	Crowded, ventricose, pallid then dingy cinnamon.	3-4 cm. by 1½-2 mm., pa flushed brown, equal, fi ile, becoming hollow.
40. ***reducta*** Lange	3½ cm., obtusely campanulate, vandyke brown, minutely fibrillose then rimose.	Broadly ventricose, almost free, dingy brown.	4-5 cm. by 4-6 mm. wit large marginate bulb, flu ed brown.
41. ***cincinnata*** (Fr.) Quél.	1½-2 cm., campanulate with an obtuse umbo, dark brown, with small, erect, pointed scales, especially at the disc, margin fibrillose	Crowded, linear or ventricose, adnate or adnexed, at first tinted violaceous, then purplish brown.	3-5 cm. by 1½-3 mm., eq light brown with violace apex, fibrillosely scaly.

Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
e.	Mild; smell of new meal.	Subamygdaloid, 10-14 × 4-7 μ	Fusoid, 50-85 × 12-25 μ mixed with clavate paracystidia.	K & M 76	Grassy places in woods, uncommon.
e, turning red-h in the stem.	Mild; smell of new meal.	Cylindrical, one end narrowed to an obtuse tip, the other often somewhat truncate, smooth, 11-15(18) × 4½-6 μ	Fusoid, 50-80 × 14-20 μ	L 111D & D1 B 731	Common on sandy soils, especially near pines. Very variable in aspect but easily recognised by the spores.
lish-brown, er in the cap.	Smell earthy.	10-12 × 5-6 μ	Ventricose, 45-65 × 13-18 μ	Møller, *Fungi of Faroes* 102A	Moorlands.
ish in cap l apex of stem, where brown, er at the base.	Mild; smell faint of new meal.	Suuff-brown, cylindric, one end narrowed, the other truncate, smooth, 12-16 × 5-7 μ	Globose or sack-shaped then flask-shaped with broad or narrow neck, size up to 90 × 12-25 μ	Heim 17(2)	In sea sand, rare.
, or flesh-oured in the n.	Mild; inodorous.	Subreniform, smooth, 8-10 × 5-6 μ according to Bresadola.	Fusoid, 55-70 × 14-20 μ (Bresadola)	B 743(1)	Damp woods. This typical form is rare.
		10½-12 × 5-6 μ	60-65 × 13-15 μ	L 200F	Deciduous woods.
.	Mild; inodorous.	Amygdaloid, 8-10 × 5-6 μ	Both slender, fusoid, and short and fat, 50-80 × 18-23 μ	L 113A	Common in mixed woods.
.	Inodorous.	Obliquely ovate, 6½-7 × 4-4½ μ	Obtuse, bottle-shaped, 44 × 14 μ, only on the gill face, edge fertile, according to Heim.	L 113C	Not uncommon in dense copses.
brown.	Smell faint.	6-7 × 4 μ	On edge and face of gills.	L 200E	Rare, in copses.
with violet at apex of	Slightly bitter; smell of new meal.	Obliquely ovate, smooth, 8-9½ × 4½-6 μ	On gill edge and face, slender fusoid, brown, 45-75 × 10-18 μ mixed with brown paracystidia on the edge.	L 111A & H	In coniferous and deciduous woods, uncommon.

Species	Cap	Gills	Stem	Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
35. *brunnea* Quél. *sensu* Konrad & Maublanc	2-5 cm., gibbous or campanulate, dark chestnut brown, silky-fibrillose, rarely scaly, margin at first white with the veil.	Crowded, broad, ventricose, whitish then rusty ochre, finally dark brown, edge white, crenulate.	2-5 cm. by 4-5 mm., equal subclavate, often bulb white, buff below, pruinose then losely striate.		Mild; smell of new meal.	Subamygdaloid, 10-14 × 4-7*μ*	Fusoid, 50-85 × 12-25*μ* mixed with clavate paracystidia.	K & M 76	Grassy places in woods, uncommon.
36. *lacera* (Fr.) Quél.	1-3 cm., convex, slightly umbonate, snuff-brown, smooth at first, fibrillose, sometimes breaking into rather ragged concentric scales, margin often split.	Crowded, ventricose or linear, whitisb then pinkish-buff, edge wbite fimbriate.	2-3 cm. by 3-5 mm., slen equal or attenuated d wards, whitish or buff brown fibrils.	...rning red- ...s the stem.	Mild; smell of new meal.	Cylindrical, one end narrowed to an obtuse tip, the otber often somewhat truncate, smooth, 11-15(18) × 4½-6*μ*	Fusoid, 50-80 × 14-20*μ*	L 111D & D1 B 731	Common on sandy soils, especially near pines. Very variable in aspect but easily recognised by the spores.
36a. *f. subsquarrosa* Møller	1-2 cm., dark brown at disc, paler elsewhere, adpressedly scaly.	Crowded, adnexed, light ochraceous-brown.	2-5 cm. by 3 mm., ...sh-brown, brown, fibrillose.	...sh-brown, ...n the cap.	Smell earthy.	10-12 × 5-6*μ*	Ventricose, 45-65 × 13-18*μ*	Møller, *Fungi of Faroes* 102A	Moorlands.
37. *halophila* Heim	1½-3 cm., semiglobate or umbonate, dark brown, shaggy and clothed with white arachnoid veil.	Deeply ventricose, free, brown witb darker edge, often growing beyond margin of cap.	Sbort, equal or tbicker a base, dark brown or ...ish, striate with fugac fibrils.	...h in cap ...pex of stem, ...bere brown, ...t the base.	Mild; smell faint of new meal.	Snuff-brown, cylindric, one end narrowed, the other truncate, smooth, 12-16 × 5-7*μ*	Globose or sack-shaped tben flask-shaped with broad or narrow neck, size up to 90 × 12-25*μ*	Heim 17(2)	In sea sand, rare.
38. *descissa* (Fr.) Quél. *sensu* Bresadola	2-3 cm., conico-campanulate with papillate umbo, greyish-white, brown at the disc, silky-fibrillose becoming subsquamulose round the umbo.	White at first tben smoky brown, subcrowded, narrow, sinuato-adnexed.	3-5 cm. by 3-4 mm., whit tinged with flesh co equal, hollow, apex pr ose.	...or flesh- ...ed in the	Mild; inodorous.	Subreniform, smootb, 8-10 × 5-6*μ* according to Bresadola.	Fusoid, 55-70 × 14-20*μ* (Bresadola)	B 743(1)	Damp woods. This typical form is rare.
38a. *f. bisporigera* Lange	Rather darker brown.	Pallid then greyish-brown.	Light brown, solid.			10½-12 × 5-6*μ*	60-65 × 13-15*μ*	L 200F	Deciduous woods.
38b. var. ***brunneo-atra*** Heim	1-2 cm., campanulate then flat with papillate umbo, rimose with radiating dark brown fibrils on paler ground, centre blackish.	Crowded, narrow, adnexed or free, greyish-ochre then light brown.	2½-3 cm. by 1½-2½ mm., or slightly swollen at base, white at apex, below, becoming hollo even splitting.		Mild; inodorous.	Amygdaloid, 8-10 × 5-6*μ*	Both slender, fusoid, and short and fat, 50-80 × 18-23*μ*	L 113A	Common in mixed woods.
39. *micraspara* Lange	1-2 cm., conic or campanulate with subacute umbo, cigar-brown, umbo darker, tomentosely fibrillose.	Crowded, ventricose, pallid then dingy cinnamon.	3-4 cm. by 1½-2 mm., pal flushed brown, equal, f ile, becoming bollow.		Inodorous.	Obliquely ovate, 6½-7 × 4-4½*μ*	Obtuse, bottle-shaped, 44 × 14*μ*, only on tbe gill face, edge fertile, according to Heim.	L 113C	Not uncommon in dense copses.
40. *reducta* Lange	3½ cm., obtusely campanulate, vandyke brown, minutely fibrillose then rimose.	Broadly ventricose, almost free, dingy brown.	4-5 cm. by 4-6 mm. wit large marginate bulb, ri ed brown.	...rown.	Smell faint.	6-7 × 4*μ*	On edge and face of gills.	L 200E	Rare, in copses.
41. *cincinnata* (Fr.) Quél.	1½-2 cm., campanulate with an obtuse umbo, dark brown, witb small, erect, pointed scales, especially at the disc, margin fibrillose	Crowded, linear or ventricose, adnate or adnexed, at first tinted violaceous, tben purplish brown.	3-5 cm. by 1½-3 mm., ... light brown with violac apex, fibrillosely scaly-	...sith violet ...t apex of	Slightly bitter; smell of new meal.	Obliquely ovate, smooth, 8-9½ × 4½-6*μ*	On gill edge and face, slender fusoid, brown, 45-75 × 10-18*μ* mixed with brown paracystidia on the edge.	L 111A & H	In coniferous and deciduous woods, uncommon.

Species	Cap	Gills	Stem
II. GONIOSPORAE. Spore outline undulating to nodulose (Spp. 42-64).			
(*a*) **Bulboso-marginatae.** (See also *napipes*.)			
42. *asterospora* Quél.	3-6 cm., campanulate, umbonate, with dark brown radiating fibrils separating to expose the white flesh.	Crowded or subdistant, ventricose, adnexed, grey then brown, edge white, fimbriate.	4-6 cm. by 5-7 mm., flushed with brown, st pruinose, equal but well-defined white ginate bulb.
43. *praetervisa* Quél.	3-5 cm., conico-campanulate, obtuse, ochraceous, rimose, umbo glabrous.	Crowded or subdistant, ventricose, adnexed, whitish then clay colour, edge fimbriate.	5-6 cm. by 3-8 mm., down to the submarg bulb, white then colour, minutely pruin
44. *xanthomelas* Boursier & Kühner	2-5 cm., conico-campanulate, umbo obtuse or acute, straw-yellow to ochraceous-brown, cuticle peels into shaggy scales exposing cream flesh.	Subdistant, broadly ventricose or linear, adnexed, white then dark clay, edge white, eroded.	3-5 cm. by 2-4 mm., us very slender, equal do a well-defined marg bulb, whitish to buff, b ening when dried, losely striate.
45. *grammata* Quél.	1½-4(6) cm., subfleshy, campanulate, umbo acute, whitish or pale clay with pinkish tint and white umbo, covered with delicate white radiating fibrils, turns dark straw-yellow in age.	Crowded, ventricose, adnexed, white then cloudy, edge eroded.	4-5 cm. by 3-6 mm., equ enlarged down to the ginate bulb, white or fl pinkish, finely striate, white.
46. *mixtilis* (Britz.) Sacc. *sensu* Kühner	2-4½ cm., campanulate, straw to golden yellow, radiately fibrillose.	Narrow, adnexed, white to greyish then dingy brown.	2½-5 cm. by 2-4 mm., down to the marginate white, cream or pale coloured, remaining when dried.
47. *fulvella* Bres.	Minute species, 6-12 mm., conico-campanulate, olive-honey with darker umbo, then dingy olive-brown with tawny umbo, silky fibrillose.	Subdistant, whitish or lilac, then cinnamon.	2-3 cm. by 1-2 mm., tap slightly down to a ginate bulb, lilac rufescent, apex white ose.
48. *fibrosa* (Sow. ex Fr.) Gillet *sensu* Metrod	6-10 cm., conical or gibbous, white, staining sulphur then ochraceous, smooth, shining.	Subcrowded, ventricose, pale buff then brown, edge white denticulate.	5-8 cm. by 1-2 cm., equ enlarged down to a form marginate base, then pale ochre with su edge to bulb, apex flo remainder fibrillose.
48a. var. *trivialis* Lange	3-4½ cm., clay-brown with white disc.	As above.	White throughout.
49. *umbratica* Quél.	1-3 cm., conico-campanulate, white, silky-fibrillose.	Crowded, narrow, adnexed, white then pinkish clay, edge white, fimbriate.	2-4 cm. by 3-6 mm., down to a submarg bulb, white, pruinose.

Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
ite.	Mild; smell of new meal, becoming musty.	Snuff-brown, outline stellate with 5-8 conical, blunt, equal protuberances, 9-12½ × 8-10μ	Hyaline, fusoid, ventricose, 40-60 × 14-20μ on face and edge of gill.	L 117G B 766(2)	Deciduous woods, especially oak, fairly common.
ite in cap, straw olour in stem.	Mild; smell of new meal.	Oblong with prominent angular protuberances, 9-12 × 6-8μ	Fusoid-ventricose, 50-75 × 15-20μ	K & M 106 B 760	Under beech and in mixed woods, uncommon.
ite.	Mild; smell faint.	Oblong with 6-7 prominent blunt protuberances, 10-12 × 7-9μ	Fusoid-ventricose with thick yellow walls, 40-60 × 11-18μ	None, spores etc. in *Bul. Soc. Myc. Fr.* 49, p. 85	Deciduous or mixed woods, uncommon.
ite in the disc, ale flesh colour lsewhere.	Mild; smell strong.	Snuff-brown, oblong with 4-5 low blunt protuberances, 7-8 × 5-5½μ	Fusoid-ventricose or cylindrical with ill-defined neck and thick yellow walls, 50-70 × 17-20μ	L 116D B 762	Among grass in open woods, e.g. of oak or birch, uncommon.
lowish.	Mild; smell of new meal.	Oblong with 3-7 angular protuberances, 7-9 × 5½-6μ	Fusoid-ventricose with thick pale yellow walls, 43-60 × 13-19μ	L 115A B 766	Mixed woods, not uncommon.
lowish, lilac at ip of stem, then eddish.	Mild; inodorous.	Oblong, outline showing 5-7 obtuse protuberances, 8-10 × 5-7½μ	Fusoid-ventricose, 45-65 × 15-19μ	B 761(2)	On mossy ground, rare.
ite, sulphur to chre below.	Somewhat bitter; smell strong of new meal.	Ovoid with obtuse protuberances, 7½-8 × 5-6μ according to Metrod, 7½-10 × 5.8-6.5μ according to Heim.	Ventricose without a well-defined neck, 50-60 × 15-22μ according to Metrod.	B 765 *Rev. de Myc.* 2, Plate 3	Coniferous woods, rare.
ite.	Smell faintly mealy.	9-10 × 7-8μ	50-60 × 18-20μ	L 116B	Not uncommon on clay.
ite, pale straw olour below.	Mild or slightly bitter; smell strong of new meal or rancid.	Triangular or oblong with prominent knobs, 8-9 × 6-7μ	Ventricose with a short neck, 40-50 × 13-15μ	B 734(2)	Under conifers, rare.

Species	Cap	Gills	Stem	Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
II. GONIOSPORAE. Spore outline undulating to nodulose (Spp. 42-64).									
(*a*) **Bulboso-marginatae.** (See also *napipes*.)									
42. *asterospora* Quél.	3-6 cm., campanulate, umbonate, with dark brown radiating fibrils separating to expose the white flesh.	Crowded or subdistant, ventricose, adnexed, grey then brown, edge white, fimbriate.	4-6 cm. by 5-7 mm., ... flushed with brown, ... pruinose, equal but ... well-defined white ... ginate bulb.		Mild; smell of new meal, becoming musty.	Snuff-brown, outline stellate with 5-8 conical, blunt, equal protuberances, 9-12½ × 8-10*μ*	Hyaline, fusoid, ventricose, 40-60 × 14-20*μ* on face and edge of gill.	L 117G B 766(2)	Deciduous woods, especially oak, fairly common.
43. *praetervisa* Quél.	3-5 cm., conico-campanulate, obtuse, ochraceous, rimose, umbo glabrous.	Crowded or subdistant, ventricose, adnexed, whitish then clay colour, edge fimbriate.	5-6 cm. by 3-8 mm., ... down to the subma... bulb, white then ... colour, minutely pru...	...n cap, straw ...r in stem.	Mild; smell of new meal.	Oblong with prominent angular protuberances, 9-12 × 6-8*μ*	Fusoid-ventricose, 50-75 × 15-20*μ*	K & M 106 B 760	Under beech and in mixed woods, uncommon.
44. *xanthomelas* Boursier & Kühner	2-5 cm., conico-campanulate, umbo obtuse or acute, straw-yellow to ochraceous-brown, cuticle peels into shaggy scales exposing cream flesh.	Subdistant, broadly ventricose or linear, adnexed, white then dark clay, edge white, eroded.	3-5 cm. by 2-4 mm., ... very slender, equal ... a well-defined ... bulb, whitish to buff, ... ening when dried, ... losely striate.		Mild; smell faint.	Oblong with 6-7 prominent blunt protuberances, 10-12 × 7-9*μ*	Fusoid-ventricose with thick yellow walls, 40-60 × 11-18*μ*	None, spores etc. in *Bul. Soc. Myc. Fr.* 49, p. 85	Deciduous or mixed woods, uncommon.
45. *grammata* Quél.	1½-4(6) cm., subfleshy, campanulate, umbo acute, whitish or pale clay with pinkish tint and white umbo, covered with delicate white radiating fibrils, turns dark straw-yellow in age.	Crowded, ventricose, adnexed, white then cloudy, edge eroded.	4-5 cm. by 3-6 mm., equ... enlarged down to the ... ginate bulb, white or ... pinkish, finely striate, ... white.	...n the disc, ... flesh colour ...where.	Mild; smell strong.	Snuff-brown, oblong with 4-5 low blunt protuberances, 7-8 × 5-5½*μ*	Fusoid-ventricose or cylindrical with ill-defined neck and thick yellow walls, 50-70 × 17-20*μ*	L 116D B 762	Among grass in open woods, e.g. of oak or birch, uncommon.
46. *mixtilis* (Britz.) Sacc. *sensu* Kühner	2-4½ cm., campanulate, straw to golden yellow, radiately fibrillose.	Narrow, adnexed, white to greyish then dingy brown.	2½-5 cm. by 2-4 mm., ... down to the marginate ... white, cream or pale ... coloured, remaining ... when dried.	...ush.	Mild; smell of new meal.	Oblong with 3-7 angular protuberances, 7-9 × 5½-6*μ*	Fusoid-ventricose with thick pale yellow walls, 43-60 × 13-19*μ*	L 115A B 766	Mixed woods, not uncommon.
47. *fulvella* Bres.	Minute species, 6-12 mm., conico-campanulate, olive-honey with darker umbo, then dingy olive-brown with tawny umbo, silky fibrillose.	Subdistant, whitish or lilac, then cinnamon.	2-3 cm. by 1-2 mm., ... slightly down to a ... ginate bulb, lilac ... rufescent, apex white ... ose.	...wish, lilac at ... of stem, then ...ddish.	Mild; inodorous.	Oblong, outline showing 5-7 obtuse protuberances, 8-10 × 5-7½*μ*	Fusoid-ventricose, 45-65 × 15-19*μ*	B 761(2)	On mossy ground, rare.
48. *fibrasa* (Sow. ex Fr.) Gillet *sensu* Metrod	6-10 cm., conical or gibbous, white, staining sulphur then ochraceous, smooth, shining.	Subcrowded, ventricose, pale buff then brown, edge white denticulate.	5-8 cm. by 1-2 cm., equ... enlarged down to a ... form marginate base, ... then pale ochre with ... edge to bulb, apex ... remainder fibrillose.	...e sulphur to ...ur below.	Somewhat bitter; smell strong of new meal.	Ovoid with obtuse protuberances, 7½-8 × 5-6*μ* according to Metrod, 7½-10 × 5.8-6.5*μ* according to Heim.	Ventricose without a well-defined neck, 50-60 × 15-22*μ* according to Metrod.	B 765 *Rev. de Myc.* 2, Plate 3	Coniferous woods, rare.
48a. var. *trivialis* Lange	3-4½ cm., clay-brown with white disc.	As above.	White throughout.		Smell faintly mealy.	9-10 × 7-8*μ*	50-60 × 18-20*μ*	L 116B	Not uncommon on clay.
49. *umbratica* Quél.	1-3 cm., conico-campanulate, white, silky-fibrillose.	Crowded, narrow, adnexed, white then pinkish clay, edge white, fimbriate.	2-4 cm. by 3-6 mm., ... down to a subma... bulb, white, pruinose.	...e, pale straw ...ur below.	Mild or slightly bitter; smell strong of new meal or rancid.	Triangular or oblong with prominent knobs, 8-9 × 6-7*μ*	Ventricose with a short neck, 40-50 × 13-15*μ*	B 734(2)	Under conifers, rare.

Species	Cap	Gills	Stem
50. *decipiens* Bres.	4½-6½ cm., obtusely conical or convex with obtuse umbo, yellowish-brown covered with a dingy grey arachnoid veil.	Crowded, ventricose, adnexed, grey then brown.	2½-4½ cm. by 4-10 mm., e down to a marginate b pinkish clay colour, stri pruinose throughout.
51. *oblectabilis* (Britz.) Sacc.	2-5 cm., obtusely conical, smooth, scarcely fibrillose under hand lens, buff-brown to dingy yellow.	Crowded, ventricose, adnexed or free, greyish-white then brownish.	2½-5 cm. by 2½-6 mm., e down to the marginate b pinkish clay colour white base and a pruinose throughout.
(*b*) **Bulbosae.** (See also *margaritispora*.)			
52. *napipes* Lange	3-5 cm., conico-campanulate with pointed umbo, umber brown or chestnut, smooth then radially fibrillose.	Slightly ventricose to linear, adnexed, whitish then dingy brown.	5-6 cm. by 5-7 mm., enla down to the bulbous which is not usually tinctly marginate, pal bove, colour of cap be fibrillose.
53. *acuta* Boud.	1-4 cm., campanulate with acute papillate umbo, smooth, innately fibrillose, bay-brown with darker umbo.	Broadly ventricose, white at first.	2-3 cm. by 2-3 mm., e down to a round or o non-marginate bulb, wh then bay-brown, bulb w apex pruinose.
54. *umbrina* Bres.	2-4 cm., campanulate, slightly viscid, radiately fibrillose, splitting, umber or chestnut brown, at first covered with a greyish veil.	Crowded, narrowly ventricose, clay colour at first.	4-6 cm. by 3-5 mm., l than the cap, fibrill striate, equal down to the round or submargi bulbous white base.
(*c*) **Equales.**			
55. *lanuginosa* (Bull. ex Fr.) Kummer (=*ovatocystis* Kühner & Boursier)	1-2 cm., convex then flat, dark snuff-brown, densely fibrillose with squarrose pointed scales at the disc.	Cream then brown.	3-4 cm. by 2½-3 mm., e slightly enlarged be clothed with shaggy fil brown above, blacl brown below.
56. *longicystis* Atk.	3-4 cm., convex then flattened, dark brown, shaggy fibrillose with erect pointed scales on the disc.	Rather broad, pallid at first.	4-7 cm. by 5-6 mm., e brown with shaggy fil pallid at apex, darker wards the base.
57. *lanuginella* (Schroet.) Lange	1-3 cm., conico-campanulate then expanded with persistent pointed umbo, ochraceous-brown, centre darker, densely radiately fibrillose separating into shaggy scales and exposing the white flesh when old, often with traces of tomentose veil on umbo.	Rather wide, cream then ochraceous, edge white fimbriate.	2-4 cm. by 5-7 mm., white ochraceous or reddish-br beneath the fibrillose face, apex pruinose.

Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
te with horny e above the ls.	Smell of new meal.	Oblong with numerous low ill-defined knobs, 10-13 × 6-8μ	Ventricose, variable, neck often ill-defined, 48-77 × 15-22μ	B 757	Roadsides on sandy soil, usually covered with sand grains.
te at the disc, nkish in the m.	Inodorous or musty.	Oblong with prominent knobs but very variable, 8-11 × 5-8μ	Ventricose, with or without a neck, 48-68 × 10-21μ	B 763	Solitary or in troops in deciduous woods, common.
d above, brown low.	Mild; smell faint or none.	Oblong, outline showing 5-6 prominent blunt knobs, 9-10 × 6μ	Ventricose, without a neck, 50-60 × 12-18μ	L 116A	Damp woods, not uncommon.
te in cap, turn- g brown in m.	Mild; smell faint, like *Russula sororia* according to Kühner.	Ovate or triangular with 5-7 blunt knobs, 8-9½ × 5½-6½μ	Cylindrical or slightly ventricose, apex obtuse, 50-74 × 14-22μ	L 117D B 759	Damp woods, e.g. birch, uncommon. Boudier's type grew among *Sphagnum.*
te, turning red- sh-brown in the m.	Mild; smell faint, not of meal.	Oblong with shallow protuberances, 7-8 × 5-6μ	Ventricose, mostly without a neck, 43-68 × 10-16μ	L 118G B 758	Coniferous woods, especially under spruce and fir, common.
te, turning own in base of m.	Mild, slightly rancid; smell earthy.	Ovate or oblong with conical knobs, 8-8½ × 5-5½μ	Ovate or pyriform, mostly without a neck and usually not crested, 35-50 × 14-20μ	Heim 33(1 & 2)	Damp, deciduous woods, not uncommon.
e.	Smell unpleasant.	Oblong with obtuse knobs, 8-10 × 5-6μ	Cylindrical or slightly ventricose and subcapitate, sometimes crested, 60-70 × 15-17μ		Common in damp woods of pine and birch, often amongst *Sphagnum.*
when wet, ving white, shed with own in the m.	Mild; smell mealy.	Oblong, nodulose with a pentagonal profile, 8-9(10) × 5-6μ	Very variable, pyriform to globular, mostly about 35-50 × 15-28μ neck short, crested.	L 117A	Amongst grass on paths in both deciduous and coniferous woods.

Species	Cap	Gills	Stem	Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
50. ***decipiens*** Bres.	4½-6½ cm., obtusely conical or convex with obtuse umbo, yellowish-brown covered with a dingy grey arachnoid veil.	Crowded, ventricose, adnexed, grey then brown.	2½-4½ cm. by 4-10 mm., equ… down to a marginate bu… pinkish clay colour, str… pruinose throughout.	with horny above the	Smell of new meal.	Oblong with numerous low ill-defined knobs, 10-13 × 6-8 μ	Ventricose, variable, neck often ill-defined, 48-77 × 15-22 μ	B 757	Roadsides on sandy soil, usually covered with sand grains.
51. ***ablectabilis*** (Britz.) Sacc.	2-5 cm., obtusely conical, smooth, scarcely fibrillose under hand lens, buff-brown to dingy yellow.	Crowded, ventricose, adnexed or free, greyish-white then brownish.	2½-5 cm. by 2½-6 mm., equ… down to the marginate bu… pinkish clay colour … white base and … pruinose throughout.	at the disc, gh in the	Inodorous or musty.	Oblong with prominent knobs but very variable, 8-11 × 5-8 μ	Ventricose, with or without a neck, 48-68 × 10-21 μ	B 763	Solitary or in troops in deciduous woods, common.
(*b*) **Bulbosae.** (See also *margaritispora*.)									
52. ***napipes*** Lange	3-5 cm., conico-campanulate with pointed umbo, umber brown or chestnut, smooth then radially fibrillose.	Slightly ventricose to linear, adnexed, whitish then dingy brown.	5-6 cm. by 5-7 mm., enlar… down to the bulbous … which is not usually … tinctly marginate, pale … bove, colour of cap be… fibrillose.	bove, brown s.	Mild; smell faint or none.	Oblong, outline showing 5-6 prominent blunt knobs, 9-10 × 6 μ	Ventricose, without a neck, 50-60 × 12-18 μ	L 116A	Damp woods, not uncommon.
53. ***acuta*** Boud.	1-4 cm., campanulate with acute papillate umbo, smooth, innately fibrillose, bay-brown with darker umbo.	Broadly ventricose, white at first.	2-3 cm. by 2-3 mm., e… down to a round or … non-marginate bulb, whi… then bay-brown, bulb w… apex pruinose.	in cap, turn- brown in	Mild; smell faint, like *Russula sororia* according to Kühner.	Ovate or triangular with 5-7 blunt knobs, 8-9½ × 5½-6½ μ	Cylindrical or slightly ventricose, apex obtuse, 50-74 × 14-22 μ	L 117D B 759	Damp woods, e.g. birch, uncommon. Boudier's type grew among *Sphagnum*.
54. ***umbrina*** Bres.	2-4 cm., campanulate, slightly viscid, radiately fibrillose, splitting, umber or chestnut brown, at first covered with a greyish veil.	Crowded, narrowly ventricose, clay colour at first.	4-6 cm. by 3-5 mm., … than the cap, fibril… striate, equal down to … the round or submargi… bulbous white base.	turning red- brown in the	Mild; smell faint, not of meal.	Oblong with shallow protuberances, 7-8 × 5-6 μ	Ventricose, mostly without a neck, 43-68 × 10-16 μ	L 118G B 758	Coniferous woods, especially under spruce and fir, common.
(*c*) **Equales.**									
55. ***lanuginosa*** (Bull. ex Fr.) Kummer (=***avatacystis*** Kühner & Boursier)	1-2 cm., convex then flat, dark snuff-brown, densely fibrillose with squarrose pointed scales at the disc.	Cream then brown.	3-4 cm. by 2½-3 mm., eq… slightly enlarged be… clothed with shaggy fib… brown above, black… brown below.	, turning n in base of	Mild, slightly rancid; smell earthy.	Ovate or oblong with conical knobs, 8-8½ × 5-5½ μ	Ovate or pyriform, mostly without a neck and usually not crested, 35-50 × 14-20 μ	Heim 33(1 & 2)	Damp, deciduous woods, not uncommon.
56. ***langicystis*** Atk.	3-4 cm., convex then flattened, dark brown, shaggy fibrillose with erect pointed scales on the disc.	Rather broad, pallid at first.	4-7 cm. by 5-6 mm., eq… brown with shaggy fibr… pallid at apex, darker … wards the base.		Smell unpleasant.	Oblong with obtuse knobs, 8-10 × 5-6 μ	Cylindrical or slightly ventricose and subcapitate, sometimes crested, 60-70 × 15-17 μ		Common in damp woods of pine and birch, often amongst *Sphagnum*.
57. ***lanuginella*** (Schroet.) Lange	1-3 cm., conico-campanulate then expanded with persistent pointed umbo, ochraceous-brown, centre darker, densely radiately fibrillose separating into shaggy scales and exposing the white flesh when old, often with traces of tomentose veil on umbo.	Rather wide, cream then ochraceous, edge white fimbriate.	2-4 cm. by 5-7 mm., white t… ochraceous or reddish-br… beneath the fibrillose … face, apex pruinose.	when wet, g white, hed with n in the	Mild; smell mealy.	Oblong, nodulose with a pentagonal profile, 8-9(10) × 5-6 μ	Very variable, pyriform to globular, mostly about 35-50 × 15-28 μ neck short, crested.	L 117A	Amongst grass on paths in both deciduous and coniferous woods.

Species	Cap	Gills	Stem
58. ***boltoni*** Heim	2½-5 cm., campanulate with obtuse umbo or gibbous, covered with dark umber radiating fibrils, dense at the disc, separating to expose buff flesh towards margin.	Crowded, linear, greyish-brown then rusty brown.	3½-5½ cm. by 4-6 mm., e light brown, fibrill striate, apex whitish, p ose.
59. ***trechispora*** (Berk.) Karst.	1-3 cm., convex, umbonate, slightly viscid when young, white, then pale ochre.	Whitish at first.	2½-5 cm. by 2-3 mm., e slender and often flex with more or less sw base, finely striate, w pruinose.
60. ***maritima*** (Fr.) Karst. *sensu* Heim	2-4 cm., thick, fleshy, campanulate with irregular lobes, cuticle thick, breaking up into adpressed scales, brown or blackish-brown becoming whitish when dry.	Distant, thick, whitish then greyish-cinnamon or olive-ochre.	Short and stout, 1½-3 cn 4-10 mm., equal or sli swollen below, solid, utely fibrillose, first w pale pinkish pruina light brown.
61. ***proximella*** Karst. *sensu* Favre non Rea	3-4½ cm., campanulate, expanding with papillate umbo, fibrillose, dark chestnut-bronze, margin slightly paler and with an arachnoid veil.	Whitish or pale clay at first.	5-10 cm. by 4-6 mm. e fibrillose, apex prui whitish then light b above, reddish-brown b
62. ***rennyi*** (B. & Br.) Sacc.	1½-2 cm., hemispherical then umbonate, covered with reddish-buff fibrils, dense at the disc, paler at the margin.	Distant, narrow, adnexed, dingy ochre.	3-5 cm. by 3-4 mm., equ enlarged upwards slightly swollen at the minutely fibrillose, than the cap, apex whi
63. ***petiginosa*** (Fr.) Gillet	1-2 cm., gibbous, clothed with fugacious whitish squamules on a silky-fibrillose light brown surface, disc glabrous, margin whitish.	Creamy yellow then brown with an olive tint, edge hairy under a lens.	2½-5 cm. by 2 mm., t equal, reddish-date-b with a white pulverul
63a. ***f. rufoalba*** (Pat. & Doass.) Heim	As above, squamules reddish-brown at maturity.	Clay coloured then rusty brown.	As above but often ciculate.
64. ***margaritispora*** (Berk.) Sacc.	3-5 cm. campanulate, yellowish-brown, fibrillosely squamulose.	Whitish then light brown.	Up to 10 cm. by 8 mm., e solid, yellowish, finely f lose.

Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
te in cap, red-sh-brown in em.	Mild; smell faint.	Oblong or subtriangular with blunt protuberances and a prominent apical knob, 8-12 × 5½-7μ outline shows about 5 knobs.	Ventricose, obtuse, thickwalled, 30-55 × 18-21μ	B 756	Coniferous woods.
te.	Smell faint.	Polygonal with obtuse knobs, 6½-7½ × 4-5μ	Fusoid-ventricose, with long neck, 40-60 × 15-20μ	L 118B	Damp woods, rare.
ite with an hraceous flush neath the sur-ce, pinkish-hite in the stem.	Mild; inodorous or a faint smell of new meal.	Oblong with slightly protruding knobs, 9-15 × 6-9μ	Very large, ventricose, capitate, with short broad neck, 45-93 × 18-29μ	Heim 31(5)	Sand dunes.
te then reddish.	Inodorous or a very faint smell of new meal.	Oblong with shallow blunt knobs, 7-9½ × 5-6½μ	Slender, long, fusoid-ventricose, 52-96 × 10-18μ	Karsten, *Icones* 5(16) & *Flor. Crypt. Suisse* 10(3) p. 129	Amongst moss on peaty soil.
w-yellow, buff ar base of stem.	Not recorded.	Oblong, irregularly nodulose, 10-22 × 5½-8½μ	Fusoid-ventricose with long narrow neck, 27-62 × 15-18μ crested.		Coniferous woods.
my, rufescent the stem.	Mild; inodorous.	Ovoid, nodulose with blunt knobs, 6½-8½ × 4-6μ	Slender-fusoid, 45-70 × 9-14μ turning sulphur-yellow in ammonia.	L 118A	Deciduous woods, especially beech, common.
bove.		As above, 7-8 × 4½-5μ	Ventricose, crested, about 50 × 11μ with obovate paracystidia.	L 117C	Coniferous woods on sandy soil.
te.	Not recorded.	Polygonal, nodulose, 8½-11 × 6-7½μ	Fusiform, thickwalled, hyaline, 50-60 × 14-18μ	L 198C	Hazel copses, rare.

Species	Cap	Gills	Stem	Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
58. *baltoni* Heim	2½-5 cm., campanulate with obtuse umbo or gibbous, covered with dark umber radiating fibrils, dense at the disc, separating to expose buff flesh towards margin.	Crowded, linear, greyish-brown then rusty brown.	3½-5½ cm. by 4-6 mm., equ… light brown, fibrill… striate, apex whitish, pru… ose.	…n cap, red… brown in	Mild; smell faint.	Oblong or subtriangular with blunt protuberances and a prominent apical knob, 8-12 × 5½-7 μ outline shows about 5 knobs.	Ventricose, obtuse, thickwalled, 30-55 × 18-21 μ	B 756	Coniferous woods.
59. *trechispora* (Berk.) Karst.	1-3 cm., convex, umbonate, slightly viscid when young, white, then pale ochre.	Whitish at first.	2½-5 cm. by 2-3 mm., … slender and often fle… with more or less … base, finely striate, … pruinose.		Smell faint.	Polygonal with obtuse knobs, 6½-7½ × 4-5 μ	Fusoid-ventricose, with long neck, 40-60 × 15-20 μ	L 118B	Damp woods, rare.
60. *maritima* (Fr.) Karst. *sensu* Heim	2-4 cm., thick, fleshy, campanulate with irregular lobes, cuticle thick, breaking up into adpressed scales, brown or blackish-brown becoming whitish when dry.	Distant, thick, whitish then greyish-cinnamon or olive-ochre.	Short and stout, 1½-3 cm … 4-10 mm., equal or sli… swollen below, solid, … utely fibrillose, first … pale pinkish pruina … light brown.	…e with an …reous flush …ith the sur…, pinkish-…s in the stem.	Mild; inodorous or a faint smell of new meal.	Ohlong with slightly protruding knobs, 9-15 × 6-9 μ	Very large, ventricose, capitate, with short broad neck, 45-93 × 18-29 μ	Heim 31(5)	Sand dunes.
61. *proximella* Karst. *sensu* Favre non Rea	3-4½ cm., campanulate, expanding with papillate umbo, fibrillose, dark chestnut-bronze, margin slightly paler and with an arachnoid veil.	Whitish or pale clay at first.	5-10 cm. by 4-6 mm. eq… fibrillose, apex pru… whitish then light br… above, reddish-brown be…	…ften reddish.	Inodorous or a very faint smell of new meal.	Oblong with shallow blunt knobs, 7-9½ × 5-6½ μ	Slender, long, fusoid-ventricose, 52-96 × 10-18 μ	Karsten, *Icones* 5(16) & *Flor. Crypt. Suisse* 10(3) p. 129	Amongst moss on peaty soil.
62. *rennyi* (B. & Br.) Sacc.	1½-2 cm., hemispherical then umbonate, covered with reddish-buff fibrils, dense at the disc, paler at the margin.	Distant, narrow, adnexed, dingy ochre.	3-5 cm. by 3-4 mm., equa… enlarged upwards … slightly swollen at the … minutely fibrillose, … than the cap, apex whit…	…ellow, buff …base of stem.	Not recorded.	Oblong, irregularly nodulose, 10-22 × 5½-8½ μ	Fusoid-ventricose with long narrow neck, 27-62 × 15-18 μ crested.		Coniferous woods.
63. *petiginosa* (Fr.) Gillet	1-2 cm., gibbous, clothed with fugacious whitish squamules on a silky-fibrillose light brown surface, disc glabrous, margin whitish.	Creamy yellow then brown with an olive tint, edge hairy under a lens.	2½-5 cm. by 2 mm., … equal, reddish-date-br… with a white pulverul…	…y, …nfoscent …e stem.	Mild; inodorous.	Ovoid, nodulose with blunt knobs, 6½-8½ × 4-6 μ	Slender-fusoid, 45-70 × 9-14 μ turning sulphur-yellow in ammonia.	L 118A	Deciduous woods, especially beech, common.
63a. *f. rufoalba* (Pat. & Doass.) Heim	As above, squamules reddish-brown at maturity.	Clay coloured then rusty brown.	As above but often … ciculate.	…se.		As above, 7-8 × 4½-5 μ	Ventricose, crested, about 50 × 11 μ with obovate paracystidia.	L 117C	Coniferous woods on sandy soil.
64. *margaritispora* (Berk.) Sacc.	3-5 cm. campanulate, yellowish-brown, fibrillosely squamulose.	Whitish then light brown.	Up to 10 cm. by 8 mm., e… solid, yellowish, finely … lose.		Not recorded.	Polygonal, nodulose, 8½-11 × 6-7½ μ	Fusiform, thickwalled, hyaline, 50-60 × 14-18 μ	L 198C	Hazel copses, rare.

Species	Cap	Gills	Stem
III. VERRUCOSISPORAE. Spore outline spiny.			
65. *calospora* Quél.	1-2½ cm., conical, acute or obtuse, bay or chestnut-brown, broken into more or less concentric recurved squamules, margin fibrillose.	Pallid then snuff-brown, ventricose, adnexed, edge white, eroded.	3-7 cm. by 1½-3 mm., ric brown, apex pallid, white, minutely stria der a lens, polished, down to the base whic have a round white b

22. Cap and stem pale fawn, rimosely tomentose, in pine woods *eutheles* (23)
Cap buff with a slight pinkish tinge, on bare ground . . *langei* (26)
(See also *whitei*, the smell of which is unknown)

23. Cap pale ochraceous with olive tint, smell unpleasant, earthy *lucifuga* (24)
Cap straw yellow with smell of almonds . . . . *hirtella* (25)
Cap bright ochre, inodorous, stem hollow . . . *auricoma* (27)
(See also *whitei*)

24. Cap covered with erect pointed scales 25
Cap not so ornamented 26

25. Medium size, stem clothed with recurved scales . . . *hystrix* (31)
Small, stem only slightly scaly, violaceous at least at the tip *cincinnata* (41)

26. Spores elongated 27
Spores ovate to almond-shaped 29

27. Spores narrowed at one end 28
Spores subcylindrical . . . . . *brunnea* (35)

28. Flesh white . . . . . *lacera* (36)
Flesh greenish in the cap, in sea sand . . . . *halophila* (37)
Flesh brownish, cap with squarrose scales towards the edge, on moorlands *lacera f. subsquarrosa*

29. Cap of medium size 30
Cap small 32

30. Cap bay-brown with a tendency to peel . . . *deglubens* (34)
Cap greyish-brown, appearing arachnoid under a lens 31

31. Stem pruinose, at least in the upper part . . . *flocculosa* (32)
Stem not pruinose, cortina attached close under the gills . *abjecta* (33)

32. Stem violaceous at the apex . . . . . *cincinnata* (41)
Stem without any violaceous tint 33

33. Cap greyish-white with brownish disc, spores 8-10 × 5-6μ *descissa* (38)
Cap with radiating brown fibrils, centre blackish, spores 8-10 × 5-6μ *descissa v. brunneoatra* (38b)
Cap cigar-brown, spores 6-7 × 4-4½μ 34

34. Large species (3 cm.) with large basal bulb . . . *reducta* (40)
Small species, less than 3 cm., stem without a bulb . *microspora* (39)

35. Stem with a basal bulb 36
Stem without a bulb 44

36. Bulb marginate, more or less sharply delineated 37
Bulb round or ovate 43

37. Large robust species, cap 6-10 cm., ochraceous . . *fibrosa* (48)
Medium-sized species 38
Minute slender species with honey-coloured cap . . *fulvella* (47)

38. Spore outline star-shaped, symmetrical, not oblong, cap rimose with dark-brown streaks, umbonate . . . . . *asterospora* (42)
Spores oblong-nodulose 39

39. Cap umber or chestnut-brown with pointed umbo . . *napipes* (52)
Cap a different shade 40

40. Cap white, silky-fibrillose, like geophylla . . . *umbratica* (49)

Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
colour in cap, dish-buff with whitish pith in stem.	Mild; inodorous.	Chocolate-brown, translucent under the microscope, subglobose, beset with blunt cylindrical processes 1-2μ long, spore body 8-10μ diameter.	Fusoid-ventricose, thickwalled with neck short or absent, 35-50 × 10-11μ	L 115C & C 1	Among dead leaves or brambles along damp roadsides, uncommon. Looks like a *Naucoria*.

Cap clay-brown with whitish disc . . *fibrosa v. trivialis* (48a)
Cap whitish to pale clay with a pink tinge, stalk tinged reddish, at least above 41
Cap straw-yellow to ochraceous 42

41. Spores mostly less than 9μ long . . . . . *grammata* (45)
Spores mostly over 9μ long . . . . . *decipiens* (50)

42. Cuticle peeling into shaggy scales, straw-yellow . *xanthomelas* (44)
Cuticle rimose, ochraceous . . . . . *praetervisa* (43)
Cuticle radiately fibrillose, straw to golden . . . *mixtilis* (46)
Cuticle smooth, buff-brown to dingy yellow, flesh pinkish in the stem *oblectabilis* (51)
Cap yellowish-brown with a grey arachnoid veil . . *decipiens* (50)

43. Cap umber or chestnut-brown with pointed umbo, stem long *napipes* (52)
Cap bay-brown with acute papillate umbo, stem short . . *acuta* (53)
Cap umber or chestnut-brown, spores small with slight knobs *umbrina* (54)

44. Light brown very small species, common under beech . *petiginosa* (63)
(If fasciculate under pines see *f. rufoalba*)
Dark-brown 45
Another colour 50

45. Densely fibrillosely shaggy 46
Cap smoother 47

46. Cap 1-2 cm., convex to flat, cystidia 35-40 × 14-20μ *lanuginosa* (55)
(If paracystidia only *I. casimiri* Vel. not yet recognised in Britain)
Cap 3-4 cm., convex to flat, cystidia 60-70 × 15-17μ . *longicystis* (56)

47. Spores less than 10μ long, cap chestnut-bronze with papillate umbo *proximella* (61)
Spores ranging more than 10μ 48

48. Cystidia narrow, 15-18μ wide . . . . . *rennyi* (62)
Cystidia larger 49

49. Cap dark umber with radiating fibrils, spores 8-12μ long, in woods *boltoni* (58)
Cap brown, breaking into adpressed scales, spores 9-15μ long, on sand dunes *maritima* (60)

50. Cystidia subglobose, cap 1-3 cm., ochraceous-brown *lanuginella* (57)
Cystidia fusoid-ventricose 51

51. Cap 1-3 cm., white then ochre, stem slender . . . *trechispora* (59)
Cap yellowish-brown, shaggy, larger, stem stout . *margaritispora* (64)

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Species	Cap	Gills	Stem	Flesh	Taste and Smell	Spores	Cystidia	Approved Figures	Habitat
III. VERRUCOSISPORAE. **65.** *calospora* Quél.	Spore outline spiny. 1-2½ cm., conical, acute or obtuse, bay or chestnut-brown, broken into more or less concentric recurved squamules, margin fibrillose.	Pallid then snuff-brown, ventricose, adnexed, edge white, eroded.	3-7 cm. by 1½-3 mm., rich brown, apex pallid, white, minutely striate under a lens, polished, e down to the base which have a round white bul	olour in cap, lesh-buff with hitish pith in tem.	Mild; inodorous.	Chocolate-brown, translucent under the microscope, subglobose, beset with blunt cylindrical processes 1-2μ long, spore body 8-10μ diameter.	Fusoid-ventricose, thickwalled with neck short or absent, 35-50 × 10-11μ	L 115C & C 1	Among dead leaves or brambles along damp roadsides, uncommon. Looks like a *Naucoria*.

22. Cap and stem pale fawn, rimosely tomentose, in pine woods *eutheles* (23)
Cap buff with a slight pinkish tinge, on bare ground *langei* (26)
(See also *whitei*, the smell of which is unknown)
23. Cap pale ochraceous with olive tint, smell unpleasant, earthy *lucifuga* (24)
Cap straw yellow with smell of almonds *hirtella* (25)
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37. Large robust species, cap 6-10 cm., ochraceous . . *fibrosa* (48)
Medium-sized species 38
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THE PROTECTION OF BIRDS ACT, 1954

This new Act of Parliament will take effect from December 1st, 1954 and supersedes some 15 previous acts. Protection is given to all wild birds and their eggs, and to their nests whilst in use. Obviously there must be exceptions. Birds may be taken for scientific purposes under license, and be trapped for ringing and release. Black-headed and Common Gull's eggs may be taken for food except in specially defined areas, and Lapwing's eggs up to April 15th for an experimental period of five years. Egg-taking by boys is not an offence under the Act if they keep to a list of common species to be drawn up and approved by the Home Secretary, but to take eggs of other species is an offence for which penalties have been stepped-up. Difficulties can be forseen here. Shooting is banned on Sundays in Scotland, and may be so banned in England and Wales in areas proscribed by the Home Secretary, to secure which areas application needs to be made by the County Councils. The councils for the three Ridings have been urged to do this. There are restrictions on the methods by which birds considered harmful may be destroyed, on the sale of live and dead birds, and on the sale of eggs, including blown eggs. The close season for ducks and wildfowl will now run from February 1st to August 31st, and for Woodcock and Capercaillie to September 30th. Bird sanctuaries may be established.

Schedule 1 lists rare birds protected completely under penalties of up to £25 for each egg, nest, or bird, with forfeiture of specimens. For commoner species the penalty is up to £5 per bird, nest, or egg. Schedule 2 lists 17 species considered to be harmful on balance, which may be destroyed by ' authorised persons ' who are defined. An advisory committee is to be set up, and the schedules may be revised from time to time to meet changing needs.

Not all the Act's provisions will meet with universal approval. Several features seem to result from the need for compromise with other interests. The list of species specially protected could have been extended with advantage. Nevertheless, Lady Tweedsmuir is to be congratulated upon her success in securing an Act that gives added protection to a large number of birds, and simplifies the laws dealing with the subject. Copies can be obtained from H.M. Stationery Office, price 9*d*.

R. F. D.

Sex Determination, by **F. A. E. Crew.** Pp. 68. Methuen & Co. 6/6.

This book, first published in 1933, has now reached its third edition and gives a compact, authoritative and up-to-date survey of the essential features of the cytology and genetics of sex determination. It is suitable for advanced students, for a full appreciation of its contents requires some knowledge of cytology and genetics. As it does not deal with the wider aspects of the subject, the approach is narrow and specialised, leaving much unanswered. However, books are recommended in which fuller and effective consideration is given to these related problems which embrace a wider field.

After following up the development of the genetic theory of sex determination, the sex chromosomes and the sex ratio are discussed. This leads to sex linkage and the significant and abnormal behaviour of the sex chromosomes, genetic inter-sexuality, and then recent work on sex determination in fish, the lower Algae, *Paramecium*, fungi, bryophytes, and the higher plants. The final chapter deals with speculation on the evolution of the sex-determinant mechanism. A great deal of ground is covered therefore in a small compass, and at times, consequentially, is too concentrated and not easy to follow, nor in parts as clear as might be, but it stimulates interest and should encourage a search for further information at a more leisurely pace. This is particularly so with regard to the recent advances and the evolution of the mechanism.

NOTES ON THE PHYTOPLANKTON OF SADDINGTON RESERVOIR, LEICESTERSHIRE

F. J. TAYLOR

During a study of the factors affecting the growth of planktonic diatoms in some Leicestershire reservoirs, a series of observations were carried out on Saddington Reservoir, which afforded an interesting comparison with the plankton of Swithland Reservoir already described (Reynolds and Taylor, 1950). Since the spring diatom maximum was the main object of study, intensive sampling was carried out only in the first halves of 1947 and 1949, but samples were collected at longer intervals during the latter parts of 1946 and 1948, and also during the summer of 1949, so that the whole yearly cycle was covered. Sampling was interrupted in the early part of 1947 by heavy falls of snow which isolated the region for a considerable period, and no samples were collected between the end of January and the middle of March. During this period the reservoir was covered with ice.

Saddington Reservoir lies about ten miles S.E. of Leicester, and was built as a storage reservoir for the Grand Union Canal. At the present it is very little used owing to the decline in traffic on the canal, and is not subjected to copper sulphate treatment as are the local drinking water reservoirs. In common with most reservoirs it was constructed by damming a valley. At the dam it is 28 ft. deep when full, and it is about half a mile long and a quarter-mile wide at its widest point. There are two arms at the shallow end, one of which receives a feeding stream whilst the other ends in a carr of alder and willow. It was estimated that about 30 per cent. of the area was deeper than 10 ft.

There is an edging of trees to the reservoir, and the shores, except where they are composed of stone walls, are very reedy, *Phalaris arundinacea** being dominant on the outside. To the inside of this there is a zone of *Oenanthe aquatica*. Local societies of *Carex acutiformis* and *Schoenoplectus lacustris* are dominant in places. In the shallow water near the stream inflow *Gylceria maxima* is abundant, and in deeper water *Potamogeton lucens*, *Polygonum amphibium* and *Ranunculus peltatus* are locally plentiful. *Fontinalis antipyretica* covers the floor of most of the deeper parts of the reservoir. The reservoir is supplied entirely by surface drainage which comes from a region composed almost entirely of Lias clay, and which is almost exclusively agricultural.

Uniform samples of water from the top 10 ft. were collected by the hose-pipe method described by Lund (1949, p. 390). Chemical analyses were carried out on this water by standard methods, and the numbers of algae in a given volume were estimated by sedimenting a known volume with saturated iodine in potassium iodide and counting under an inverted microscope. In addition, qualitative plankton samples were collected by towing a bolting silk net, having 180 meshes to the inch, behind a rowing boat.

Annual Periodicity.

The periodicity follows the main lines described for temperate lakes. The dominant group of algae is the diatoms, a feature characteristic of silted lakes with a high basic ratio (Pearsall, 1932) and these form large maxima in spring, followed by a smaller maximum in the autumn. The summer plankton is characterised by an assemblage of a large number of different green algae, each in small quantity.

The winter plankton is sparse, being dominated by *Asterionella formosa* and *Cryptomonas* spp., none of which reach concentrations above 10 cells/ml. *Cyclotella compta*, which was practically absent from the winter plankton in 1946-47 became very important in the early part of 1949, though it may have been missed under the ice in 1947. This species was characteristic of the winter plankton of Swithland Reservoir with *Asterionella formosa*, but the third characteristic winter form, *Closterium aciculare* was very rare in Saddington.

In both years the spring diatom increase began towards the end of January, though when regular sampling began at the end of January 1949, *Cyclotella compta* had already reached high concentrations. The 1947 increase was apparently terminated prematurely by the complete freezing over of the reservoir for two months. When sampling was resumed towards the end of March the reservoir was still covered with ice, and conditions appeared to be much the same as when sampling

* The nomenclature of the flowering plants follows Clapham, Tutin and Warburg, 1952.

ceased. The deep snow cover over the ice may have prevented algal growth by reducing the light intensity. The resumption of ice-free conditions led to the immediate increase in the number of diatoms, but instead of the diatom maximum being composed of *Asterionella* as in most lakes of this type, it was mainly composed of *Diatoma elongatum*, with *Asterionella* only in small quantity. *Synedra acus* var. *danica* also contributed to the diatom maximum which was at an end by the beginning of June.

In 1949 the maximum began at roughly the same time, and again was virtually ended at the beginning of June, but owing to the more favourable weather and the absence of ice cover there was a high diatom concentration for the whole of this period. The maximum was not dominated by a single diatom, but after the *Cyclotella* maximum, *Diatoma elongatum* and *Synedra acus* var. *danica* reached high concentrations. *Asterionella* was even less abundant than in 1947. Besides these species other diatoms increased in abundance, though not to such a large extent. These were mainly a small *Synedra* sp., *Diatoma vulgare*, *Fragilaria crotonensis* and *F. capucina*.

During these maxima the net plankton consisted almost entirely of diatoms. In 1949 the nannoplankton was abundant in *Cryptomonas* spp., which reached a maximum of 2,130 cells/ml. on May 11th, though in 1947 they were much less abundant. In 1949 too, *Glenodinium* sp. and *Mallomonas acaroides* were associated with *Cryptomonas* in small numbers.

After the beginning of June, when the diatoms had practically disappeared from the plankton, this was dominated by an assemblage of green algae, none of which became important individually. *Coelastrum microporum*, *Oocystis solitaria*, and *Scenedesmus quadricauda* were the only ones to reach a concentration greater than 20 colonies/ml., the latter giving the highest recorded concentration of 45 colonies/ml. It is interesting to note the relatively large number of desmids for this type of lake found at this time of year—13 out of 16 recorded species.

For the rest of the year there is not so much detailed information, but the plankton from mid-July to mid-September appeared to be dominated by *Fragilaria crotonensis* and *Dinobryon divergens*. This is the characteristic time for a growth of the latter alga in lakes which have a decided spring diatom maximum and a high calcium content (Pearsall, 1932). *Fragilaria* was not so abundant as in Swithland or the Metropolitan Water Board reservoirs, but the small growth may have been limited by shortage of silica. Although not so spectacular, there was an increase in the numbers of *Asterionella* at this time. For instance, in 1949 *Asterionella* disappeared from the sedimentation counts on May 18th and for the next month was so rare that it was rarely recorded even from the net hauls. It is hard to give any estimate of its concentration in the reservoir at this time, but by calculation from the volume of water filtered by the net, this comes out at the order of 1 cell/10 l. By June 8th, although the silicate concentration had risen to only 0·9 mg./l, *Asterionella* had reached a concentration of 29 cells/ml., while the *Fragilaria* counts were of the order of 200 cells/ml.

During this period there were only occasional blue-greens, mainly *Microcystis* spp., *Anabaena inaequalis* and *Aphanizemenon flos-aquae*, though the longer intervals between sampling may have missed a rapid rise and fall in the numbers lasting two or three weeks. However, there was no prolonged water bloom in either year, and the total blue-green concentration never rose above 12 filaments/ml.

About the end of September the autumnal diatom maximum began, and this lasted into November. In both years this was composed solely of *Asterionella*, but only reached small proportions (up to 250 cells/ml.). During this maximum the nannoplankton was characterised by *Crucigenia tetrapedia* with occasional individuals of *Kirchneriella obesa*.

Chemical Changes in the Water.

Since the reservoir is shallow there is no opportunity for a pronounced thermal stratification, and the temperature of the surface water never differed by more than 1·5° C. from the bottom temperature. Even so, dissolved oxygen measurements showed that the lowest layers were deoxygenated to some extent in summer, the lowest values recorded being about 30 per cent. of saturation, which indicates some stratification of the water. However, there were no significant differences between the other chemical analyses of top and bottom water.

The water is hard. The hardness increased slowly during the spring and summer to a maximum of about 165 mg. calcium carbonate/l, followed by a rapid fall to 130 mg. calcium carbonate/l in early winter, after which it increased again.

Silicates were fairly high, reaching nearly 6 mg. SiO_2/l in the winter, but this concentration fell during the spring diatom growth to a level of 0·5 mg./l or less. The end of the diatom maximum coincided with the attainment of a silicate concentration of 0·5 mg./l. After remaining at this low level for three to four weeks, the concentration rose slowly to the winter maximum, the summer and autumn diatom growths having little obvious effect on the concentration. However, it is interesting to note that the rate of fall of the silicate concentration in 1949 was slower than in 1947, although the total fall in concentration was the same in both years, and the diatom production was much greater in 1949. This suggests that silicates were entering the reservoir at a much greater rate in 1949 than in 1947, or possibly the cold weather of 1947 retarded the return of silicates from the bottom deposits. The rainfall in the first six months of 1949 was only about half that of the corresponding six months of 1947 (data from Kibworth Harcourt, two and a half miles north-east of Saddington Reservoir), so that the explanation does not lie in the greater leaching of the surrounding land by rain.

Nitrates showed a similar, though not so pronounced, fall with the growth of diatoms in the spring. There was a greater fall in 1949 which may be correlated with the greater production of algae. Ammonia showed a similar relation to algal growth as was noted in Swithland Reservoir (Reynolds and Taylor, 1950). High concentrations corresponded to the end of algal maxima and were presumably due to the breakdown of the dead algae.

Phosphates disappeared during the early spring in 1947 and were not detectable all summer (i.e. concentration less than 0·0002 mg. P/l). In 1949 they were barely detectable at all, even in early spring.

Biotic Effects.

The effect of various biological factors on the phytoplankton was not studied extensively. Although occasional diatoms were infected with chytrids, infection never reached epidemic proportions or appeared to influence the periodicity. Accurate counts of the infected algae were not made, but the incidence of infection never rose above 1 per cent. of the individuals of a given species.

Likewise, grazing by zooplankton appears unimportant. The important diatoms are all large and of awkward shape so that their ingestion is problematical. Although large filter feeders might possibly exert a selective grazing effect, the only diatom which was noted as being ingested was *Cyclotella*, used as food by various rotifers, though the green colour of the gut of various Cladocera indicated that they had been feeding on some of the smaller green algae.

Discussion.

The main course of the algal periodicity in Saddington Reservoir follows that in Swithland Reservoir (Reynolds and Taylor, 1950), though there are differences in detail. Even though Saddington is not treated with copper sulphate there is no pronounced water bloom of Myxophyceae, the summer plankton being characterised by *Fragilaria crotonensis*. Here again it is suggested that the explanation lies along the lines suggested by Hutchinson (1944) that the conditions determining the rise of *Fragilaria* and *Anabaena* are the same, but that when the nitrogen content of the water is high *Fragillaria* dominates the plankton, and when it is low *Anabaena*.

It is interesting to find *Diatoma elongatum* so much more prominent in the plankton than *Asterionella*, and it is hard to point to any environmental factors which favour *Diatoma* rather than *Asterionella*, especially as the former is absent from the autumnal maximum. As far as the writer is aware, *Diatoma elongatum* has not previously been recorded as forming part of the spring diatom maximum in this country, though frequently present in the plankton. Its behaviour in Saddington is reminiscent of its occurrence in some of the Danish and North German lakes (Huber-Pestalozzi, 1942, p. 433). Its growth form in Saddington, zigzag chains, corresponds to the Continental spring growth form, and not to the star-shaped colonies found in summer, and which Huber-Pestalozzi considers are the result of higher summer temperatures. No star-shaped colonies were seen in Saddington.

Dinobryon was a much more abundant alga in Saddington than in Swithland, and this may perhaps be related to the higher nitrogen/phosphorus ratio in the former reservoir.

Summary.

An account is given of the periodicity of the plankton algae in Saddington Reservoir, Leicestershire, and it is shown that the main outlines follow those described for silted temperate lakes with a high basic ratio, though *Diatoma elongatum* is the most abundant diatom in the spring maximum.

Acknowledgements.

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List of Species Observed

The species asterisked have not previously been recorded for Leicestershire.

CHLOROPHYCEAE

Volvocales.

Carteria sp. Rare in the summer.
Chlamydomonas spp. Occasional individuals, mainly in spring and autumn.
Pandorina morum (Müll.) Bory. Occasional individuals in summer and early autumn. Nothing like so common as in Swithland.
Eudorina elegans Ehrenb. Frequent. From June until December.
Volvox aureus Ehrenb. Frequent in June and July, rare at other times. Oospores observed in July.
Sphaerocystis schroeteri Chod. Rare.
Gemellicystis neglecta Teil. em. Skuja. Frequent in the summer.

Chlorococcales.

Pediastrum duplex Meyen. Present with *P. boryanum*. but not so common.
P. boryanum (Turp.) Menegh. Present in most samples. Forms fitting into various described varieties were seen, but these did not appear to be very constant.
P. tetras (Ehrenb.) Ralfs. Frequent. Summer only.
**Trochisia aspera* (Rein.) Hansg. Rare.
**Micractinium pusillum* Fresen. Rare.
Oocystis solitaria Wittr. Occasionally throughout the year, but becoming common in the summer. This was recorded for Beacon Hill by Rich (1933) as ' probably this species, but very little of it was seen,' otherwise there is no record for Leicestershire.
**Tetraedron minimum* (A. Br.) Hansg. Frequent, especially in spring and autumn.
Ankistrodesmus falcatus (Corda) Ralfs. Throughout the summer in low numbers. Most individuals fitted into var. *acicularis* (A. Br.) G. S. West.
Kirchneriella obesa (West) Schmidle. Common in October and November 1946, but rare at all other times.
Dictyosphaerium pulchellum Wood. Rare except in October 1948.
**Crucigenia tetrapedia* (Naeg.) Gay. Common in the autumn, reaching a concentration of 68 colonies/ml. on October 30th, 1946.
Scenedesmus quadricauda (Turp.) Breb. Present in small amounts in all collections, but becoming more common in summer with concentrations of up to 50 colonies/ml.
S. obliquus (Turp.) Kütz. Rare.
Coelastrum microporum Naeg. Common throughout the summer, from June to October, reaching concentrations of 50 colonies/ml.

ULOTRICHALES.

Ulothrix tenerrima Kütz. Occasional filaments in May 1947. Miss Rich recorded an inidentified *Ulothrix* sp. from Saddington in May 1915.

Hormidium flaccidum (Kütz.) A. Br. A few filaments of the aquatic form were found in the summer of 1949.

CLADOPHORALES.

Rhizoclonium hieroglyphicum Kütz. Some filaments were found in May 1949.

CHAETOPHORALES.

Aphanochaete repens A. Br. Found on *Oedogonium* sp. by Miss Rich in May 1915.

OEDOGONIALES.

Oedogonium rothii Pringsh. Found by Miss Rich in May 1915 with oospores, but not included in Rich (1925), where the only record is an old one by Bates.

O. rufescens Wittr. f. *exiguum* (Elfv.) Hirn. May 1915, very common, Miss Rich.

Oedogonium spp. In addition to the above, Miss Rich found one unidentified species, 20μ wide, in May 1915, and two species, 10μ and 25μ wide respectively, in September 1915. I found one 22μ wide in May 1949.

Bulbochaete sp. May 1915, Miss Rich. Very rare.

CONJUGALES.

Mougeotia spp. Rare, June and July 1949. Miss Rich also found two unidentified species, one in May 1915, and the other in September 1915.

Zygnema cruciatum (Vauch.) Ag. em. Trans. May 1915, Miss Rich. Very common.

Zygnema sp. 21μ wide, September 1915, Miss Rich.

Spirogyra spp. I found at least three species in small floating mats on the surface of the water in May and June 1949. None were conjugating.

**Penium cucurbitinum* Biss. Rare, October 1948.

Closterium venus Kütz. Frequent, mainly in June and July.

C. moniliferum (Bory.) Ehrenb. Rare, June 1949.

C. acerosum (Schrank) Ehrenb. Rare, October 1948 and June 1949.

C. peracerosum Gay. Rare, April 1949.

C. pritchardianum Arch. Found throughout the year in small quantity.

C. aciculare West. Found throughout the year, though not prominent in the winter plankton as in Swithland.

**Cosmarium undulatum* Corda. The type of this species was found in association with the var. *minutum* in June 1947. The size of the type was rather larger than that given by West and West (1905)—75-80μ long, 55-60μ broad, with the width of the isthmus 15-20μ.

**C. undulatum* Corda var. *minutum* Wittr. Frequent in the summer plankton in 1947, but not so abundant in 1949. It is not recorded for Leicestershire by Rich (1925), but West and West (1905) record it from Leicestershire on the authority of Roy.

C. meneghinii Breb. May and September 1915, Miss Rich.

**C. humile* (Gay) Nordst., var. *substriatum* (Nordst.) Schmidle. September 1915, Miss Rich, but not given in Rich (1925).

C. subcrenatum Hantzch. Rare, June 1949.

C. botrytis Menegh. Found throughout the year. Also found in both her samples by Miss Rich.

Staurastrum gracile Ralfs. Frequent throughout the year.

S. paradoxum Meyen. Not so common as the preceding species. (The reverse holds for Swithland.) The variants found in Swithland (Reynolds 1940,) were not found in Saddington.

**S. hexacerum* (Ehrenb.) Wittr. Occasionally in the summer.

XANTHOPHYCEAE

Botryococcus braunii Kütz. Occasional colonies found.

CHRYSOPHYCEAE

**Mallomonas acaroides* Perty. Whilst rare in 1947, this species was common in the nannoplankton in the spring and summer of 1949, maintaining a concentration

of between 20 and 40 individuals/ml. between the beginning of March and the beginning of June.

Dinobryon divergens Imhof. This species rose in abundance in May of each year together with *Fragilaria crotonensis* and dominated the plankton after the end of the diatom maximum until August. The population remained fairly constant around 500 loculi/ml.

**Sphaerobryon fimbriata* Taylor (1954). This alga, described as new from Saddington, was found in October 1948.

BACILLARIALES

**Attheya zachariasi* J. Br. This was found in a sample collected from Saddington for class work and photographed about 1938.

Melosira varians Ag. Present throughout the year, but only common in October 1946.

**M. granulata* (Ehrenb.) Ralfs, var. *angustissima* Müll. Present throughout the year, but only common in June 1947. I am grateful to Dr. J. W. G. Lund for identifying this alga.

Cyclotella compta (Ehrenb.) Kütz. Occasionally throughout the year, but only formed a large maximum in the early part of 1949, reaching a maximum concentration of 2,560 cells/ml. on February 16th.

Stephanodiscus hantzschii Grun. Infrequently in spring 1947, becoming more abundant in early summer. Though a typical river alga, it has been found in Swithland, and also in some London reservoirs.

Meridion circulare (Grev.) Ag. April 1947 only.

**Diatoma vulgare* Bory. A characteristic species of the spring diatom maximum, though only reaching concentrations of up to 250 cells/ml. The type does not appear to have previously been recorded for Leicestershire.

D. elongatum (Lyngb.) Ag. The most abundant alga in the spring diatom maximum, reaching concentrations of over 2,500 cells/ml. After the maximum the species was not seen during the summer, and only rarely during the winter.

Fragilaria crotonensis Kitt. The most frequent diatom in the summer plankton, being found at the same time as *Dinobryon divergens*. It only reaches concentrations of up to 450 cells/ml. in Saddington (in Swithland at the same season it reached over 3,000 cells/ml. in 1946), but this small growth may be due to shortage of silica.

F. capucina Desmaz. This species is also found in the spring diatom maximum in small numbers, up to about 100 cells/ml.

**Synedra ulna* (Nitzsch.) Ehrenb., var. *danica* (Kütz.) Grun. Also abundant in the spring maximum, reaching 2,300 cells/ml. in 1949. Rare during the rest of the year.

Synedra sp. A small species about 20-30μ long was frequent in the spring maximum, reaching a concentration of 650 cells/ml. in 1947 and 300 cells/ml. in 1949. Rare during the rest of the year.

Asterionella formosa Hass. Another constituent of the spring maximum, but only reaching 700 cells/ml. in 1947 and 400 cells/ml. in 1949. This was the only diatom present in the autumnal diatom maximum.

**Eunotia praerupta* Ehrenb. April 1947 only. Type not recorded.

Cocconeis placentula Ehrenb., var. *lineata* (Ehrenb.) Cleve. Rare, April 1947.

**Achnanthes minutissima* Kütz. Rare, May 1915, Miss Rich, but not given in Rich (1925).

**Mastogloia smithi* Thw. Rare, on a few occasions.

Stauroneis phoenicenteron Ehrenb. Rare, February 1949.

**Navicula exigua* (Greg.) O. Müll. Occasionally in the winter.

Navicula spp. Other unidentified species were occasionally present.

Gyrosigma attenuatum (Kütz.) Rabh. Infrequently throughout the year.

Pinnularia viridis (Nitzsch.) Ehrenb. Frequent.

**Amphora normanii* Rabh. Rare, November 1946.

A. ovalis Kütz. Not very common, mainly in spring and autumn.

**Cymbella tumida* (Bréb.) v. Heurck. Frequent throughout the year.

C. cistula Hemp. Rare, November 1946 and May 1949 only.

C. prostrata Berk. Rare, May 1949.

Gomphonema acuminatum Ehrenb. Frequent, attached to pieces of debris.

G. augur Ehrenb. Often found with *G. acuminatum*.

**Gomphonema geminatum* (Lyngb.) Ag. Rare. The frustules found were not attached to any substratum and were probably washed off the rocky parts of the shore by wave action.
Epithemia argus (Ehrenb.) Kütz. Found by Miss Rich on *Oedogonium* sp., September 1915. The only record for the county.
Rhopalodia ventricosa (Grun.) O. Müll. Found by Miss Rich, September 1915.
Nitzschia sigmoidea (Nitzsch.) W. Sm. Frequent throughout the year.
N. parvula W. Sm. Occasionally in the winter.
N. sigma (Kütz.) W. Sm. Rare in the winter.
Cymatopleura solea (Breb.) W. Sm. Occasionally from December to February.
C. elliptica (Breb.) W. Sm. Rare.
Surirella capronii Breb. Occasional.
S. robusta Ehrenb. Occasionally throughout the year.
**S. robusta* Ehrenb., var. *constricta* (Ehrenb.) v. Heurck. Rare, March 1949.
Campylodiscus hibernicus Ehrenb. July 1949 only.

CRYPTOPHYCEAE

Cryptomonas spp. Two species were present, one of which closely resembled *C. ovata* Ehrenb. The other was larger and commoner. They were always present in the nannoplankton, and reached a total concentration of 2,200 cells/ml. in May 1949.

DINOPHYCEAE

Gymnodinium sp. One small species was present in the plankton on a few occasions.
Glenodinium sp. One species was common in the nannoplankton, expecially in the spring.
**Peridinium cinctum* Ehrenb. Frequent throughout the year.
**P. anglicum* G. S. West. Only seen in November 1946 when, however, it was frequent.
Ceratium hirundinella O.F.M. Frequent throughout the year, but not reaching such importance as it does in some lakes, though Professor Ingold informs me that in 1938 the reservoir was ' stiff with *Ceratium* '.

EUGLENINEAE

**Euglena oxyuris* Schmarda. Rare, May 1949.
E. spirogyra Ehrenb. Occasionally throughout the year.
Euglena spp. On a number of occasions species of this genus were found which could not be identified.
**Phacus longicauda* (Ehrenb.) Duj. Occasional in the summer and autumn. Miss Rich recorded this species in her collection in September 1915, but does not list it in the algal flora.
P. pleuronectes (O.F.M.) Duj. Rare.
Trachelomonas volvocina Ehrenb. Occasionally throughout the year.
T. hispida (Perty) Stein. Rare, May 1949.

CYANOPHYCEAE

**Microcystis marginata* (Menegh.) Kütz. Rare.
M. aeruginosa Kütz. em. Teiling. Occasionally in summer and autumn.
M. flos-aquae (Wittr.) Kirch. em. Teiling. Frequent in summer and autumn.
Coelosphaerium naegelianum Ung. Frequently present, but not in such abundance as in Swithland.
Merismopedia glauca (Ehrenb.) Näg. Rare, summer and early autumn.
Oscillatoria limosa Ag. Occasionally throughout the year.
Spirulina major Kütz. Rare, May 1949.
Anabaena inaequalis (Kütz.) Born. & Flah. Summer and early autumn, but never very common. Found by Miss Rich, September 1915.
Aphanizemenon flos-aquae Ralfs. Associated with *Anabaena*.
Tolypothrix sp. Found by Miss Rich, May 1915.

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MASSIVE RED DEER HEADS

HENRY TEGNER

A remarkable red deer's head has recently been presented to the Hancock Museum at Newcastle-upon-Tyne by Captain C. D. Burrell, of Broome Park, near Alnwick. This interesting relic was unearthed whilst draining operations were proceeding in Bolton Bog.

I have seen this head and have taken measurements. The antlers, which are attached to the upper half of the skull, carry nineteen points. The horn is rough and dark in colour. Although the specimen gives one the impression of being of great age there is no sign of fossilisation. I have tried unsuccessfully to discover further details concerning the origin of this very fine stag's head.

Another great Northumbrian head is that mentioned in *The Mammals of Great Britain and Ireland,* by J. G. Millais, and which the author refers to as the Cresswell Bog head. This head, which at one time was at Middleton Hall, near Wooler, in Northumberland, was considered by Millais to be one of the finest specimens extant of the red deer of the Pleistocene era. He states that the Cresswell Bog head is a most beautiful example of the type of heads some of these indigenous red deer carried.

I was anxious to try and find the Cresswell Bog head. It was not at Middleton Hall but I finally traced it to Firwood, near Wooler, the property of Miss Margaret Simpson who immediately gave me every opportunity to examine and measure this head. It is very similar in condition, appearance, and dimensions to the Bolton Bog head.

This Northumbrian head was dug up about the year 1833 from the Moss of Cresswell, an offshoot of the great Glendale Lake, which, towards the end of the Glacial epoch, is supposed to have spread over the present fertile valley of the Wooler Water, immediately to the east of the Cheviots, and where, to-day, the main Newcastle to Coldstream road runs.

The complete remains of this stag were found in a deposit of Pleistocene marl and peat in a standing position.

The Moss of Cresswell and Bolton Bog are twelve miles apart in a direct line. Bolton Bog lies within sight of the River Aln which runs through the town of Alnwick to the sea at Alnmouth—it was also probably within the scope of the great Glendale Lake.

I am inclined to regard these two heads as being of a similar era. They are I believe both the heads of indigenous Northumbrian wild red stags, and not as has been frequently suggested the relics of park red deer of which a number were kept, in the past, in enclosures at Alnwick, Hulne and Chillingham.

The 'Bolton Bog' Red Deer Head

The 'Cresswell Bog' Red Deer Head

SPURN IN LATE FEBRUARY

JOHN CUDWORTH

Most people who visit Spurn go there in spring and autumn when migrational rushes can be expected, with their associated rarities. Of course, it is important to have these periods fully covered but the peninsula can be no less interesting during the winter months. Perhaps the following account may encourage more people to consider visiting Spurn in the early part of the year.

On February 27th and 28th, 1954, W. E. Dickinson, R. V. Jackson, A. H. B. Lee, R. F. Dickens and the writer stayed at Warren Cottage with A.H.B.L. remaining until March 1st and R.F.D. until March 3rd. The weather was mainly bright and clear but cold. On the morning of February 27th there was a covering of snow which, however, quickly melted. A further storm on the afternoon and evening of February 28th brought a thick coating of snow to the peninsula and the Humber shore was fringed with frozen snow at the tide's edge.

In spring and autumn the main attractions are the numbers of passerines to be seen. Such birds were down to a minimum and interest centred on the Humberside and the sea-coast. Soon after daybreak on February 27th a Red-throated Diver was spotted on the mud of the Humberside. After an encircling movement the bird was caught. It made little attempt to move until we reached it when it leapt clear of the mud letting out a wild, harsh cry. It appeared to be uninjured and had probably come down blinded by the snowstorm and had been stranded by the ebb-tide. We all remarked on the lovely dark-red eye. The bird was taken to the seacoast where a further 30-40 Divers, apparently all Red-throated, were on the sea or flying up the coast. They were accompanied by one, possibly two, Goosanders.

Small pools of water behind the chalk bank attracted parties of Dunlins and Ringed Plovers, some of the latter brightening the winter scene by their display flights. One with conspicuously darker upperparts than the rest may have been of the Arctic race, *tundrae*. The Humber mud-flats as usual held many waders, although they were fewer than we had expected. Knots, up to *ca.* 3,000, and Dunlins, up to *ca.* 500, were the most numerous, with Curlews, Bar-tailed Godwits and Redshanks in smaller numbers. Grey Plovers were few, as were Turnstones, and Sanderlings preferred the cleaner sands near the lifeboat cottages.

Also scattered along the Humberside were small numbers of Shelducks, Mallard and Wigeon. The last, like the waders, were fewer than we had expected, numbers having dropped from the usual 200-300 wintering birds to a mere 30. One of the highlights of the week-end was a raft of *ca.* 500 Scaup on the Humberside, first noticed as the sun flashed on the gleaming white flanks of 250+ drakes. The Scaup were accompanied by a flock of 50+ Common Scoters.

At least one Merlin was seen on each day and may have been responsible for the corpses of Dunlin and Knot. Excellent views were obtained as this male bird perched on the wire-dump trap.

Although numbers of passerines were down to a minimum those seen were extremely interesting. A typical bird of Spurn in winter, rarely seen inland, is the Snow Bunting. During our stay a flock of 20-30 could usually be found near the chalk bank, feeding along the top of the beach or along the high tide line. One bird was watched at very close quarters near to Warren Cottage; but even more exciting it was to examine five male birds in the hand when they were trapped and ringed. Only few were caught compared with the 100 ringed in February last year, since our visit was so short that they were only just learning to come to bait when it was time for us to leave.

Other birds present, mainly restricted to coastal areas, included Hooded Crow, Rock Pipit and Stonechat. A Corn Bunting sang on most days. On March 3rd a second bird in company with five others (possibly his wives ?) was also in song; and a further flock of 23 of this species was seen. Reed Buntings, probably returned breeders, were in song throughout the area.

In winter not much can be expected in the traps but here again quality made up for quantity. Besides the Snow Buntings, birds ringed included a Goldfinch and a Common Gull, the latter caught during a period of snow on March 1st. An interesting retrap was a Reed Bunting ringed at Spurn as a juvenile in August, 1950.

THE MOULTING OF PRIMARIES BY THE COMMON CURLEW (*Numenius a. arquata*)

IRENE WERTH
Department of Zoology, University of Leeds

A LARGE flock of Common Curlew, *Numenius a. arquata*, is centered each year from the end of June to the beginning of October around Malham Tarn in the Craven Pennines. The numbers are not static but increase to a maximum of *ca.* 3,000 in early August and then decrease gradually until the final birds leave in October or, in mild autumns, some may linger on into November. Apart from the composition and activities of such inland flocks, which will be discussed elsewhere, the progress

TABLE I

Primary No.	10	9	8	7	6	5	4	3	2	1
June 27–July 3	4	3	5	1						
July 4– ,, 10	1									
,, 11– ,, 17	1	1								
,, 18– ,, 24	9	8	15	9	8	2				
,, 25– ,, 31	3	3	3	6	10					
Aug. 1–Aug. 7	6	7	10	7	18	11	1	1		
,, 8– ,, 14	1		1	2	3	6	3			
,, 15– ,, 21						1	1			
,, 22– ,, 28				5	4	2	7	4	1	
,, 29–Sept. 4	2		1		4	8	6	6		1
Sept. 5– ,, 11										
,, 12– ,, 18							1			
,, 19– ,, 25										
,, 26–Oct. 2										
Oct. 3– ,, 9						1			1	

of the moult of the primary feathers whilst the birds are in this area is worthy of attention.

The flock uses the area around Malham Tarn as a day roost and may be found on the limestone pavement on the top of Highfolds Scar above the tarn, or on the Tarn Moss which forms the western boundary of the tarn, or, when the flock becomes very large, there may be units in both places. The main activities at the roost are sleeping and preening, so the aftermath of a settled flock is an area with large numbers of loose feathers lying about on it. At intervals varying from a few days to a week feathers were collected from two selected areas, one on Highfolds Scar and another on the Moss during the flocking period, and a subsequent examination of the primaries was made. These primary feathers are fairly easily identified on the basis of shape and size, but in order to be quite certain they were matched against two complete sets of primaries obtained from birds found dead in the area during April when the primaries are all fully grown. The primaries were numbered on the basis

shown in *The Handbook of British Birds*, the outer feather No. 1 and the innermost No. 10, but the sequence of moult is the reverse, the innermost or No. 10 being dropped first followed by the others in turn. In the curlew, which moults its primaries in this sequence, a feather is dropped when the previous one is about one-third grown, or barely emerging from its sheath, so that at any given time during the moult of the primary feathers there will be one feather missing, the previous one a third grown and the one before that two-thirds grown, forming a noticeable and considerable gap in the wing which must interfere with the efficiency of flying to some extent.

The first date on which feathers were collected was June 27th and for convenience in compiling the table the period over which feathers were collected has been arbitrarily divided into weeks from this date. The table gives the numbers of each primary collected within each seven-day period.

The main point to emerge from the table is that the moult of primaries in the curlew is a rapid process (cf. that of the wood pigeon *Columba p. palambus* which only moults its primaries at intervals of roughly a month), and takes place practically entirely whilst the birds are in the Malham Tarn area. It seems likely that the birds begin to moult their primaries as soon as they join the flock, for the first feathers were collected when there were 70 birds in the area, but the main sequence appears only later when numbers are rising rapidly, *e.g.* July 18th, 240; July 20th, *c.* 700; July 25th, *c.* 2,000; August 5th, *c.* 3,000. It seems therefore from this fact of the primaries being moulted whilst the birds are at Malham and the inference that flying may be impeded, that this large inland aggregation of migratory birds is a moulting halt. This is a phenomenon which occurs in other birds, *e.g.* lapwings which make such a halt on the coast of Holland. A study of the British Birds ringing returns for the curlew shows that birds from Scandinavia and northern England winter on the west coast of Great Britain and extensively in Ireland, thus the relatively undisturbed area of Malham Tarn would be *en route* for both groups of birds, though to be quite certain of this more extensive ringing and some form of trapping is necessary.

In general the principal and only complete moult in the life of a bird takes place after the breeding season. This post-breeding moult entails the replacement of the quills of the tail and wings as well as the rest of the plumage. There is often in some birds a partial moult just before the breeding season resulting in the assumption of a breeding plumage; in such a moult it is chiefly body feathers which are replaced. The partial or spring moult is therefore a less energy-demanding process, presumably so that energy is not diverted from the reproductive process. The post-breeding moult on the other hand comes after a period of ample food supply when the birds are in good condition and able to stand the strain of growing a complete new set of feathers. This moult may take place on the breeding grounds before migration as in geese and ducks, after arrival in the winter quarters, *e.g.* swifts and probably all early migrants, or on passage, there being a halt during migration for the bulk of the moult to take place, *e.g.* the lapwing which certainly makes such a halt, and the curlew. There is evidence that there are other large flocks of curlew in the north of England at this time of year and it is suggested that these are probably all moulting halts. The birds are therefore combining two energy-demanding activities at this period, moulting and migration, and it seems likely that the two are incompatible so that species which moult in passage have to make a halt of this nature in order to complete the bulk of the moult.

Acknowledgments

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YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1954

AUSTWICK, June 5th—7th

The meeting was well attended, fifteen societies responding to the roll-call. On the Saturday a start was made by car to Chapel-le-dale for the ascent of Ingleborough, but the limestone pavement of Southerscales and Scar Close proved far too attractive and very few crossed Black Shiver Moss to climb up the Mere Gill stream and get to the Arks, a tumbled mass of huge millstone-grit boulders where the Fir Clubmoss is abundant. This and the summit were reached by very few. We were favoured by the weather on this occasion but were less fortunate on a visit to Austwick Moss next day. On the Monday we enjoyed a fine morning when John Ray's ' path in a mountainous pasture ' from Wharfe towards Smearsett was followed and we had lunch on the short herbage full of Alpine Bistort which Ray went to see. Later, while we were scrambling on the steep craggy side of Smearsett, rain commenced, and we got very wet before reaching Wharfe Wood on our way back. Our President, the Rev. T. Basil Kitchen, took the Chair at the meeting at which the weekend was voted most successful.

Ornithology (Ralph Chislett): There was an absence of the unusual until we were on our way homeward. The birds expected were duly seen. Those unexpected, although mentioned in the circular, like the Stonechat, were absent. Half-expected species such as Grasshopper Warbler, Corncrake and Short-eared Owl were not seen. Lesser Redpolls (nest found by J. Armitage) and Sedge-Warblers, twittered above and below the birches on Lawkland and Austwick Mosses. A visit to Clapham Woods added Wood-Warbler, Chiffchaff, Goldcrest and Coal-Tit (nest found with young) to our list. Spotted Flycatchers did not seem to have arrived. Wading birds were prominent. A pair of Oystercatchers had a nest with one egg, a former nest having been robbed. Curlews were vociferous and plentiful. Snipe, Redshank, Golden Plover and Lapwing had young. Sandpipers were rather scarce.

Other species noted included Carrion Crow, Rook, Jackdaw, Magpie, Jay, Greenfinch, Chaffinch, Reed-Bunting, Skylark, Meadow and Tree-Pipits, Yellow and Pied Wagtails, Garden Warbler, Blackcap (one), Whitethroat, Ring-Ousel, Wheatear, Redstart, Dipper, all the Swallow tribe and the Swift, Green Woodpecker, Cuckoo, Little and Tawny Owls, Kestrel, Heron, Black-headed and Lesser Black-backed Gulls, Moorhen, Grouse, Pheasant and Partridge.

When travelling homeward *via* Ingleton and Hawes, a grey crow flew across our front near Gearstones. I stopped the car and had a perfect view of a Hooded Crow standing in the field bordering the road. The grey parts of the plumage appeared to be slightly paler than on most of those that occur at Spurn. The Ornithological Report for 1953 contains a reference to one seen in the same area on June 12th, 1953, by P. Young, and to a hybrid shot there and confirmed by E. Blazard (Carlisle).

Conchology (Mrs. E. M. Morehouse): The molluscs listed in 1940 were all seen except for *Helicella itala* L. and *Jaminea secale* Drap. Failure to find the latter was do doubt due to the extreme dryness of its habitat. Molluscs were well hidden among stones, etc. *Balea perversa* L. and *Pyramidula rupestris* Drap. can be added to the 1940 list. The latter has extended its range and is well established.

Botany (R. Lewis and M. M. Sayer): In such a well-known area as the Craven district of Yorkshire we were not disappointed that no new records were made.

Some of the more interesting plants noted were *Hornungia petraea* (L.) Rchb., of which only three plants in fruit were seen, *Aquilegia vulgaris* L., *Actaea spicata* L., in quantity, and *Botrychium lunaria* (L.) Sw. all on the limestone pavement area above Chapel-le-dale. *Arenaria gothica* Fr. was seen at the well-known station at Selside. Other notable plants were *Trollius europaeus* L., *Potentilla crantzii* (Crantz) Beck, *Saxifraga hypnoides* L., *Primula farinosa* L. and *Convallaria majalis* L. On Monday afternoon we had torrential rain so that Wharfe Wood went virtually unexplored though *Aquilegia* was seen in flower. In the morning we saw *Polygonatum odoratum* (Mill.) Druce in very fine flower, with *Geranium sanguineum* L. on Oxenber. On Smearsett there were many plants of *Polygonum viviparum* L. in Ray's original station ' in a mountainous pasture 1½ miles from Wharfe on the footpath to Settle.'

There were only a few flowers and some plants with bulbils only. *Hippocrepis comosa* L. was not seen but another plant of the *Polygonatum* was found at Smearsett. Ferns were plentiful and one quite small hollow in the pavement above Chapel-le-dale yielded nine or ten species including the Green Spleenwort, Rigid Buckler and Brittle Bladder Ferns.

At Austwick Moss on Sunday *Andromeda polifolia* L. was seen in flower, also *Sparganium minimum* (Hartm.) Fr. Nearly a dozen different species of *Carex* were also collected. One of the writers (R.L.) independently examined a small calcareous bog on a steep bank above the River Greta north of Ingleton, where a very interesting association of plants was noted. *Schoenus nigricans* L. formed pure stands, and both the many-headed cotton-grasses (*Eriophorum augustifolium* Honck., and *E. latifolium* Hoppe) were present as well as *Pinguicula vulgaris* L., *Primula farinosa* L. in very fine condition, *Trollius europaeus* L., and a number of sedges and rushes.

Bryophytes were searched for but no additions were made to the long lists already existing. A search for *Pallavicinea* at Austwick Moss was unsuccessful.

In the excursion circular reference is made to the woodland species occurring in the crevices of the limestone pavement as being evidence of the existence of woodland in the past. One of the writers of these notes (R.L.) wonders whether this matter has been proved conclusively, because after the examination of extensive tracts of pavement both in the Craven area of Yorkshire and in South Westmorland one finds it difficult to believe that woodland could have existed on such terrain. If the present tendency of the weathering and breaking up of the limestone has been going on over a long period of time the position would, in fact, be reversed, that is as the limestone breaks up and the fissures widen and become filled with humus, so trees and shrubs begin to colonise the pavement. The fact that such woodland species as *Allium ursinum* L., *Anemone nemorosa* L., *Mercurialis perennis* L., *Convallaria majalis* L., and *Actaea spicata* L., occur in the fissures would appear to be that the climatic and shade conditions are similar to those found in woodlands. It would be interesting to have the views of other botanists on this question.

We cannot conclude these notes without a reference to the passing away of Chris. A. Cheetham so soon after we had all had the pleasure of his company, and his expert guidance at our meeting. C.A.C. probably knew the plants of the Craven area better than any other present-day naturalist and he will be sadly missed by his many friends.

NORTH CLIFFE, June 19th

Some trouble was given to members by an unfortunate error in the circular, where the direction stated east instead of west, and on the one-inch map the house to which we were directed was not shown. Fortunately, members who came to Market Weighton station were met by cars and carried to their destination. We certainly could not have been more kindly entertained, and the weather helped to make our visit a memorable occasion. North Cliffe Wood was part of Mr. Burstall's estate and this turned out to be a most interesting area, but, as with most of the country investigated, the drought and lack of moisture had not improved matters. The Market Weighton Canal of the map was certainly not a water-way but a muddy ditch which, however, seemed to be appreciated by the conchologists. The rhododendrons in the Low Plantation on East Common were a fine sight but the place was dried up and gave no hope for the special moss that used to occur here.

After the tea provided by Mrs. Burstall, a meeting for reports was presided over by Mr. Ralph Chislett and Mr. and Mrs. Burstall were thanked by G. H. Ainsworth on behalf of all the members present.

Ornithology (Ralph Chislett): A small but representative party inspected woods, massed rhododendrons, and bracken-lands under the guidance of Mr. E. B. Burstall. Forty-six species were noted. Bird-song was already becoming subdued, but Blackcaps, Garden Warblers, Whitethroats, Willow-Warblers and Sedge-Warblers were in good voice. Finches included Linnet, Chaffinch, Bullfinch, Greenfinch and Tree-Sparrow. Corn and Reed-Buntings were noted. Tree-Pipits were

fairly numerous and were feeding young. Spotted Flycatchers had eggs. A Blackbird's nest with young had held seven eggs. A Moorhen had built in the fork of a tree six feet above ground. Green Woodpeckers called. Turtledoves were fairly numerous. Curlews and Lapwings complained from meadows. Red-legged Partridges were numerous and a deserted nest held nine eggs and nine of Pheasant.

The shaded and sun-lit lawns of Mr. and Mrs. Burstall provided an idealistic setting for the alfresco tea and meeting, during which a pair of Yellow Wagtails paid frequent visits to the trim grass, disappearing each time over the hedge to the adjoining field with bills full of insects.

Conchology (Mrs. E. M. Morehouse): A total of 19 molluscs was taken when the Y.N.U. visited the Market Weighton Canal, part of which, unfortunately, is silted up. Some old brick ponds were more profitable, but nowhere were molluscs plentiful. The following list shows the results:

Paludestrina jenkinsi Smith
Limnaea pereger Müll.
Physa fontinalis L.
Sphaerium corneum L.
Acroloxus lacustris L.
Planorbis corneus L.
P. umbilicatus Müll.
P. albus Müll.
P. fontanus Lightfoot.
P. contortus L.
Planorbis spirorbis L.
Bithynia tentaculata L.
B. leachi Sheppard.

Pisidia

Succinea putris L.
H. nemoralis L.
Pyramidula rotundata Müll.
Hygromia hispida L.
Arion ater v. *aterrima* Taylor.

Mycology (John R. Norris): Two woods were visited: a small mixed wood adjacent to Mr. Burstall's house and Low Wood, consisting largely of young conifers.

The small wood was very wet in places and a number of Myxomycetes and Discomycetes were taken. Of the Myxomycetes *Ceratiomyxa fruticulosa* Macbr. was plentiful and good specimens of *Arcyria nutans* L., *Lycogala epidendrum* Fr. and *Stemonites fusca* Roth. were obtained. Of the Discomycetes *Orbilia xanthostigma* Fr. and *Mollisia cinerea* (Batsch) Fr. were plentiful, frequently occurring together. *Dasyscypha nivea* (Hedw. fil.) Sacc. and *Trichoscyphella hahniana* were also taken. *Rosellinia aquila* (Fr.) de Not. and *Diatrype stigma* (Hoffm.) de Not. represented the Pyrenomycetes.

Low Wood was very dry indeed and few species were collected. *Stereum hirsutum* (Willd.) Fr., and *Hymenochaete rubiginosum* (Dicks.) Lév., were fairly plentiful, as were *Hypoxylon coccineum* Bull., *Peniophora* spp. and *Diatrype stigma* (Hoffm.) de Not. *Chaetosphaeria phaeostroma* (Mont.) Fuckel was also found.

As was to be expected at this time of year there were very few of the larger Basidiomycetes but a few species of *Lactarius* and *Marasmius* were seen on the fringes of Low Wood.

GOATHLAND, July 3rd

A fine and mainly sunny afternoon favoured the meeting at Goathland, though some heavy rain earlier in the morning may have deterred some members from coming. The start, unfortunately, was delayed, as the train from Leeds and York arrived an hour late, and owing to the consequent lack of time Fen Bog was not visited. The ornithologists went off to Randy Mere and most other people concentrated on West Beck, starting at Mallyan Spout. In these circumstances it was not to be expected that any unusual plants would be seen, and perhaps the most interesting species observed was the Cranberry, of which specimens were brought in by one of the ornithologists from Randy Mere. The woods about the beck are very pleasant though, the plants present including *Crepis paludosa* (L.) Moench., *Carex pendula* L., *Melampyrum pratense* L. and *Luzula sylvatica* (Huds.) Gaud., the last two abundantly in different places. It was sheltered from the breeze by the beck, and conditions were good for work on insects. At the meeting which followed tea at headquarters, the President was in the Chair and seventeen societies answered to the roll. It was the first meeting of the Union after the sudden death of Mr. Cheetham the previous week.

Ornithology (Ralph Chislett): *Comparison of Species seen at Goathland and at Tanfield Meetings.* At both these places the areas worked were mainly stream-side woodland with adjacent arable land, so it seems appropriate to consider them together. Species identified numbered 53 at Goathland, 59 at Tanfield. Seven birds noted at Goathland were not noted at Tanfield, viz.: Red Grouse, Whinchat and Meadow-Pipit for habitat reasons (all occur near Tanfield on higher ground a few miles away) and Mistle-Thrush, Wood-Warbler, Bullfinch and Grey Wagtail because of more retiring habits at this late date. The woods at Tanfield showed several Nuthatches, Woodcocks, Chiffchaffs and Marsh-Tits, whilst Herons were still about the trees that held their nests—none of these were noted at Goathland. The Tanfield area also produced Goldfinch, Tree-Sparrow, Little Owl, Turtle Dove, Lapwing, Redshank, and Black-headed Gull. The Pied Flycatcher breeds in both areas, and failure to see it at either testified again to the facility the species has for disappearance immediately after the young have left their nest-holes. The Dipper too was not noted in either area, although breeding in both.

The species common to both areas were: Carrion Crow, Rook, Jackdaw, Magpie, Jay, Starling, Greenfinch, Linnet, Chaffinch, House-Sparrow, Yellowhammer, Skylark, Tree-Pipit, Pied Wagtail, Tree-Creeper, Great-Tit, Blue-Tit, Coal-Tit, Long-tailed Tit, Spotted Flycatcher, Willow-Warbler, Garden Warbler, Blackcap, Whitethroat, Song-Thrush, Blackbird, Redstart, Robin, Hedge-Sparrow, Wren, Swallow, Martin, Sand-Martin, Swift, Green and Great Spotted Woodpeckers, Tawny Owl, Kestrel, Wood-Pigeon, Golden Plover, Sandpiper, Curlew, Moorhen, Pheasant and Partridge.

Reptilia: There seems no doubt that a reptile seen rather briefly by Miss Mattinson and Mrs. Payne at the upper edge of the wood bordering West Beck was a Slow Worm.

Mosses and Hepatics (Mrs. Joan Appleyard): Mallyan Spout and its vicinity was worked for bryophytes and although the quantity of species seen was considerable the quality was on the whole not outstanding. One new vice-county record was made by Miss Robertson, who collected *Heterocladium heteropterum* (Bruch) B. & S. var. *flaccidum* B. & S. *Blindia acuta* (Hedw.) B. & S. var. *trichodes* (Wils.) Braithw., an old record, was confirmed but careful search failed to turn up *Brachyodontium trichodes* (Web., fil.) Bruch or *Hygrobiella laxifolia* (Hook.) Spruce, both recorded from near Mallyan Spout. *Tetraphis browniana* (Dicks.) Grev. was abundant in good fruit and *Eucalyx hyalinus* (Lyell) Breidl. was very fine. Boulders in the stream were covered by dense mats of *Marsupella emarginata* (Ehrh.) Dum. Other species noted include *Calypogeia arguta* Nees & Mont., *Aplozia crenulata* (Sm.) Dum., *Lophozia floerkii* (Web. & Mohr.), Schiffn., *L. attenuata* (Mart.) Dum., *Scapania irrigua* (Nees) Dum., *Dicranella squarrosa* (Starke) Schp., *D. rufescens* (Sm.) Schp., *D. cerviculata* (Hedw.) Schp., *Barbula rigidula* (Hedw.) Mitt. and *Hookeria lucens* (Hedw.) Sm.

TANFIELD, July 10th

A rather small party had an interesting day at Tanfield in dull but fine weather. Early in the day vegetation was very wet from rain the previous night, and this restricted sweeping for insects. One of our more striking plants, Viper's Bugloss, made a fine show in the disused gravel pit between Tanfield and Nosterfield. This pit was interesting in showing a partially calcicole flora including Blackstonia. The disused quarry near Well showed a better developed calcicole flora and a part where Thyme and Rockrose were growing in some quantity on more or less exposed rock was very attractive. On leaving the quarries at Well our President and Mr. Utley kindly took some of the party along to some wetter ground at Ing Goit and near Camp Hill Plantation. A good tea was provided by Mrs. Hall at the Bull Hotel and six societies answered to the roll-call at the meeting afterwards, the President being in the Chair.

Ornithology: See the report on the Goathland meeting above.

Mammalia and Amphibia (J. P. Utley): So far as variety is concerned the district covered made a very poor show. Hare, Rabbit, Water Vole and Frog were

recorded at the meeting. There was, however, one important contribution: some members of the party were granted a view of a Red Squirrel. This is most encouraging, particularly as the grey species was not mentioned as having been seen.

Flowering Plants (Miss C. M. Rob): In a district as well worked as Tanfield there seemed little hope of making new records, and the discovery of *Scrophularia vernalis* L. near Nosterfield was a pleasant surprise. It grows at Burril, near Bedale, where it has decreased considerably in the last ten years, and has gone from its other two stations in V.C. 65, Middleton Tyas and Firby. More than 300 species of flowering plant were listed, the old gravel pit providing a number not seen elsewhere, including *Ophrys apifera* Huds., *Echium vulgare* L., *Myosotis caespitosa* K. F. Schultz, *Blackstonia perfoliata* (L.) Huds., *Veronica polita* Fries., *Senecio viscosa* L., *Geranium columbinun* L., *G. pyrenaicum* Burm., *Inula conyza* DC., and *Carex pairaei* F. Schultz.

Daphne laureola L., was in the wood near Nosterfield. The disused quarry near the village had a number of calcicoles; amongst them *Carlina vulgaris* L., *Anacamptis pyramidalis* (L.) L. C. Rich., *Campanula glomerata* L., *Rosa spinosissima* L., *Acinos arvensis* (Lam.) Dandy, *Bromus erectus* Huds., and *Gentianella amarella* (L.) H. Sm. *Trifolium striatum* L., was also noted here, another unexpected find for the area. In Well Scar Quarry were *Cynoglossum officinale* L., *Papaver somniferum* L., *Erigeron acris* L. (also in the gravel pit) and *Lathyrus tuberosus* L.

Other plants of interest seen were *Poa nemoralis* L., *Berberis vulgaris* L., *Allium scorodoprasum* L., *A. oleraceum* L., *Filipendula vulgaris* Moench, *Helleborus viridis* L., *Stellaria nemorum* L., *Platanthera bifolia* (L.) L. C. Rich., and *Poa compressa* L. Near Binsoe the Male Fern had suffered from the effects of selective weedkiller used on the adjoining fields. Bracken growing near seemed to be little affected.

Mosses (Mrs. Joan Appleyard): It was too late in the year to find early spring fruiting species such as *Poltias* and *Phascum curvicollum* Hedw. which are probably present in the quarry at Well. The floor of the Nosterfield gravel pit was covered with a moss carpet but the species were all common ones, including *Barbula fallax* Hedw., *Bryum caespiticium* Hedw., *B. capillare* Hedw. and in damper places, *B. pallens* (Brid.) Rohl. and *Cratoneuron filicinum* (Hedw.) Roth. *Encalypta streptocarpa* Hedw. grew in large patches. In the quarry at Well, besides most of the above species there were *Climacium dendroides* (Hedw.) Web. & Mohr., *Camptothecium lutescens* (Hedw.) Brid., and *Orthotrichum anomalum* Hedw. var. *saxatile* (Wood) Milde. The most interesting find was *Acrocladium cordifolium* (Hedw.) Richards & Wallace growing to a height of eight inches in a wet place by the roadside at Ing Goit.

Mycology (Miss Ann Allison): It was rather too early in the year to find many agarics, although the wet weather had brought some up. The following species were found in small numbers: *Boletus scaber* (Bull.) Fr., *B. elegans* (Schum.) Fr., *Coprinus plicatilis* (Curt.) Fr., *C. lagopus* Fr., *Marasmius rotula* Fr., *Pluteus cervinus* (Schaeff.) Fr., *Auricularia auricula-judae* (L.) Schroet., and *Polystictus versicolor* (L.) Fr. A large number of Stinkhorns (*Phallus impudicus* (L.) Pers.) was found in a wood between Thornborough and Nosterfield and also in this wood sporophores of *Hypholoma fasciculare* (Huds.) Fr., were numerous.

TODMORDEN, July 17th

An enjoyable meeting was held at Todmorden in spite of the showery weather. Eight societies were represented at the indoor meeting after tea. Mr. Chislett was in the Chair.

Mammalia: Mr. F. Dean reports that he was able to take members to see the dreys of Red Squirrels, which species was introduced into the area by him in 1942. The species has done extremely well and is extending its range to other woodlands. The Grey Squirrel has not yet reached the area. Though no foxes were seen, they are plentiful in the district. Over fifty have been dispatched in the last few months. In spite of the abundance of foxes, rabbits are plentiful and at present increasing. Badgers do not now occur nearer than Winterburn, near Gargrave, but they are doing well there. Water Vole, Long-tailed Field Vole, Long-tailed Field Mouse and Bank Vole are present, but the last is rare.

Ornithology (Mr. Ralph Chislett): On a showery, windy day it was decided to eschew the high moors and reservoirs, and to explore samples of the wooded cloughs, after which the party of five visited Hardcastle Crags and Woods. Species noted numbered 28 and included Tree-Pipit, Pied and Grey Wagtails, Tree-Creeper, Spotted Flycatcher, Willow-Warbler, Redstart, Green Woodpecker, Dipper, Sandpiper, Curlew, Black-headed and Lesser Black-backed Gulls and Moorhen. Avian quietude appropriate to the date was intensified by the weather, and some species that kept under cover were undoubtedly missed.

Flowering Plants: Mr. Geoffrey Baker reports that in the main area visited, about Wickenberry, the following were among the plants seen: Field Scabious, Devil's-bit Scabious, Sheep's-bit, Eyebright, Cathartic Flax, Frog Orchis, Sneezewort, Golden-rod, Marsh Pennywort, Adder's Tongue and Meadow Cranesbill. The last is perhaps unusual, as it is on a rough hill pasture on gritstone. Some members spent a little time in the region of Folly, near Lumbutts, and found Melancholy Thistle and the Small Balsam, *Impatiens parviflora* DC. Higher up the clough at Folly is a large patch of the Great Horsetail, *Equisetum telmateia* Ehrh.

Mycology: Mr. R. Watling reports on behalf of the three mycologists present that material was scarce and that what there was was mostly in poor condition. Most attention was paid to Discomycetes. Of the twenty species noted the following are the most interesting: *Helotium scutula* (Pers.) Karst., on old stems of *Salvia; Dasyscypha apala* Mass., on old stems of *Juncus; Tapesia fusca* (Pers.) Fuckel, on old wood; *Orbiliopsis* sp., on old wood, submerged in water. I sent this to Dr. R. W. G. Dennis, Kew, who writes: ' I cannot suggest a specific name for it, nor do I think that there is anyone living who could.' Nannfeldt described and figured a number of species, one of which closely resembles it, but he too did not venture to suggest a name. (Watling, Herb. No. 653) *Mycena galopus* (Pers.) Fr., on leaves; *Entoloma sericeum* (Bull.) Fr., among grass; *Galera hypnorum* (Schrank) Fr., among moss; *Stereum purpureum* (Pers.) Fr., parasitic on *Crataegus*.

FIELD NOTES

Bryology Section at Askrigg.—The Bryological meeting at Whitfield Gill, Askrigg, held on April 29th, was attended by three members. The Gill was well worked by the older bryologists but I do not know that much collecting has been done there recently. Most of the species seen have been recorded before but even one noteworthy addition makes it worth while revisiting a classic locality.

In Mill Gill, on the floor of the old dam, now dried up, there was a great deal of *Pellia fabbronia* Raddi in fruit. *Marchantia polymorpha* L. *c.fr.*, *Fossombronia pusilla* (L.) Dum., and *Pohlia delicatula* (Hedw.) Grout *c.fr.* were also collected there. *Orthotrichum anomalum* Hedw. var. *saxatile* (Wood) Milde and *O. cupulatum* Brid. grew on the walls in Mill Gill. In Whitfield Gill proper, the genus *Seligeria* was represented by *S. pusilla* (Hedw.) B. & S., *S. doniana* (Sm.) C.M. and *S. trifaria* (Brid.) Lindb., all fruiting. *Nowellia curvifolia* (Dicks.) Mitt., was abundant on a fallen tree trunk. This is only the second record for V.C. 65. *Anomodon viticulosus* (Hedw.) Hook. & Tayl. was seen in fruit by Mr. Shaw who also records *Mnium orthorrhynchum* B. & S. A small *Aplozia* was collected which may prove to be *A. atrovirens* (Schleich.) Dum. var. *sphaerocarpoidea* (De Not.) Massal. The gathering has been submitted to Dr. E. W. Jones for his opinion. Among the other species noted were: *Fissidens rufulus* B. & S., *F. pusillus* Wils. ex Milde, *Dicranella varia* (Hedw.) Schp., *Gymnostomum aeruginosum* Sm. *c.fr.*, *Trichostomum tenuirostre* (Hook. & Tayl.) Lindb., *Mnium stellare* Hedw., *Rhynchostegiella teesdalei* (Sm.) Limpr. *c.fr.*, *Metzgeria pubescens* (Schrank) Raddi and *Cololejeunea calcarea* (Lib.) Schiffn.—Joan Appleyard.

Stratiomys potamida Mg. **(Diptera—Stratiomyidae) in Yorkshire.**—The first Yorkshire capture of this fly was by Mr. J. M. Brown at Robin Hood's Bay, V.C. 62 (recorded by Mr. C. A. Cheetham, *The Naturalist*, 1946, p. 168). The second was taken by Mr. W. G. Bramley at Lindrick Common in extreme S.E. Yorkshire, V.C. 63 (*The Naturalist*, 1947, p. 168). A third specimen, not hitherto recorded, was taken by myself at Roundhay, Leeds, V.C. 64, on July 9th, 1953. —H. Henson.

Obituaries

C. A. CHEETHAM, F.R.E.S.
(1875—1954)

Christopher Arthington Cheetham was born in Horsforth on February 2nd, 1875, and was the eldest of a family of seven. He first went to a small private school in Horsforth, from there to Woodhouse Grove School and on to the Leeds Boys' Modern School, where he developed a taste for natural history which remained with him all his life. In a short paper which he wrote for *The Naturalist* in 1943 on ' The Silvery Moss ' occurs the following passage: 'As a school-lad I made myself a type of microscope from a small pocket telescope, and I was looking at the capsule of a moss, almost certainly of this species, when to my astonishment I saw the teeth on the capsule edge slowly opening and closing and the capsule turning around. Later I found all the movement was due to moisture from my breath.' We get here a glimpse of significant beginnings. There was the practical ingenuity shown in the making of the rough microscope and there was already the trend of the mind in the direction of mosses, a loved pursuit which he was still following in the last period of his life.

In 1905 Cheetham became a member of the Yorkshire Naturalists' Union, and in 1908 was elected to the Executive. He had already written his first formal botanical article. This was published in the *Bradford Scientific Journal* in 1906 and was on the mosses of the Calverley District. In the same year he began his contributions to *The Naturalist* with a report on the botany of the Ingleton meeting of the Y.N.U. At this time he came under the influence of two outstanding personalities, William West and Samuel Margerison. He was a student at Bradford Technical College under William West, who was remarkable for his power in inspiring in his pupils a love of natural history. He was also a protégé of Samuel Margerison who was a pioneer in ecology. With this influence so strong in his two mentors we shall not be surprised at the later successes of Cheetham in tackling ecological problems. I will only mention here his paper in *The Naturalist* on Pennine Peat and also the fact that he was in 1920 the convenor of the Y.N.U. Peat Committee while to the Union's scheme of 1942 he contributed two articles on the Ecology of Heather moor. Since no one can be a botanical ecologist without knowing his plants well we may here refer to Cheetham's wide knowledge of British and especially of Yorkshire plants. He became a member of the Bradford Naturalists' Society in 1911, and in the early years of his membership scarcely a year passed but he made significant contributions to the annual Recorder's Report on Flowering Plants. Thus the finding, jointly with Mrs. Appleyard, in 1949 of the White Beaksedge at Helwith Moss was only the last of a long series of successes as a field botanist.

Field naturalists in those days were luckier than they knew in being able to get about by train to distant places so much more cheaply than nowadays. The more notable places that Cheetham visited were Donegal and West Ireland, South-west Ireland, the island of Islay, Humphry Head, Kent's Bank, Silverdale, Holker and Coniston Lake. Often his companion on these trips was A. R. Sanderson (on the Silverdale trip they rode a tandem bicycle) and there grew up between these two an outstanding friendship. It must have been with a heavy heart therefore, that Cheetham wrote the obituary of his friend, who had retired from a scientific post in the Malay States in 1931 to live at Austwick Hall near Cheetham, and had died suddenly in 1932.

These various excursions provided material for public lectures and Cheetham became a well-known and popular lecturer. The lecture on ' Irish Plants and Places ' may be looked upon as the peak of many lecturing successes. Cheetham had prepared a hundred and eighty auto-chrome slides and must have felt well rewarded by the audience of over seventy which was at least twice the normal attendance at a Bradford Naturalists' lecture. The wide sweep of his interests was seen in this lecture where, in addition to the special plants of West Ireland, he dealt also with geology, peasant industries, rock pools of the shore and ancient churches.

We have seen that Cheetham's schoolboy enthusiasm was for mosses and that his first written article was on the same subject. He took a more serious position as a bryologist when he was elected to the Recordership in the Bradford Society in 1928. During his long career he was never Recorder in this subject for the Y.N.U. as he was always keen to find, and successful in finding, other holders of that post.

Yet he kept up a keen interest in and wide knowledge of mosses and was always capable of giving the report on mosses on any excursion. He made frequent additions to the county moss list. In this subject also his ecological turn of mind came out strongly, particularly in his paper in 1939 on the moss flora of boulders. Here he correlated this flora with the chemical constitution and the physical texture of the boulders and also with their position as to moisture supply and exposure to sunshine, the whole forming a remarkable article.

Another group on which C.A.C. became an expert was the Diptera (flies). He did not take over the Recordership for Diptera for the Union till 1918 and his first appearance as a dipterist for the Bradford Society was in 1919. His development was rapid. He made additions to both the county and the British list and by 1924 among the specimens sent by him to F. W. Edwards of the British Museum was one which proved to be new to science. This, one of the Daddy-longlegs, was named by Edwards *Tipula cheethami*, and he thus rendered Cheetham's name permanent as a dipterist. It always gave Cheetham pleasure to be recognised as an expert on his favourite 'Daddies.' Edwards visited Cheetham at Austwick and they frequently searched for flies together in various parts of Yorkshire. As Recorder in Diptera for the Y.N.U. he sent in a series of reports from almost every Y.N.U. excursion from 1918 to 1953, a wonderful and sustained record in the field. His papers in *The Naturalist* on the flies were often illustrated and showed that he had striking gifts for drawing.

He had a considerable knowledge of geology and was for some time a member of the Leeds Geological Society.

Cheetham was a popular selection for the secretaryship of the Y.N.Union in 1934. He had recently resigned from business and gone to live at Austwick. Freed from other duties, with such varied tastes in natural history as he had already shown, he was an ideal occupant of the post. He had for long been secretary of the botanical section and he henceforward attended the meetings of other sections in his official capacity. Many, like myself, looked forward to his report on Austwick plants, especially to the flowering of his favourite Purple Saxifrage which, occurring early in the year (sometimes in February) ushered in the long pageant of the summer on which he always had some discerning observations to make.

He took a major part in the publication of the Transactions of the Union and used them to make complete records of the state of the various branches of natural history in Yorkshire. In the annual report for 1946 he stated that that year had seen the completion of the task of bringing the botanical knowledge of the county up-to-date. ' This,' he said, ' was commenced by the publication in 1937 of the *Catalogue of the Yorkshire Fungi* (Mason and Grainger) followed by the *Supplement to the Yorkshire Floras* (Cheetham and Sledge) in 1941. The revised accounts and lists of *Yorkshire Mosses* (Cheetham), *Sphagna* (Thompson), *Liverworts* (Milsom) and *Lichens* (Watson) appeared in the Union's Transactions for 1945 and the current year.'

The Secretary's work involved many platform appearances. His manner was easy and affable, and he had a ringing voice which was pleasant to listen to. His almost constant presence at the outdoor excursions, with his cheerful greeting to all, was a powerful unifying influence in the Union.

No view of Cheetham can be complete which does not mention his activities as a cyclist. He joined the C.T.C. and became a prominent figure in it, holding leading positions, including that of consul. Cycling was his principal means of locomotion about the county for attending Y.N.U. meetings. Twice while travelling to annual meetings of the Union, in December, 1929, at York, and at Malton in 1948, heading for Scarborough, he met with accidents. The second mishap had serious consequences and he was never fully restored from it, yet nothing agrees more with his courageous spirit and wonderful physique than the remarkable recovery he made and the degree of mobility he regained in his last years.

His voice as a speaker has already been mentioned. It must be added that he was thoroughly musical and that he became choir master at Austwick church. It was very characteristic of his mind that he was at the same time choir master for the Austwick Methodists. His singing powers once came out strongly on an Irish tour, for it is recorded that ' around the party's tent in the dusk of an evening, when a sing-song was being held, numerous shadowy figures assembled attracted by the baritone voice of a well-known bryologist.'

We have been looking at a man who had ability, driving force, and zeal in the execution of the duties of the special post he occupied for the last twenty years of his life, but it was at Austwick, his home for this long period that we saw him in

the setting which seemed most natural to him and brought out best the facets of his personality. No one who saw him in his native place and received his hospitality there will ever forget his fund of kindness or the great reservoir of specialised country knowledge that he had. One saw him there in the characteristic costume that was so fitting and thought of him as a part of the country scene. He was specially interested in the remains of prehistoric dwellings in the Austwick neighbourhood

Photo by] [*John Armitage, F.R.P.S.*

and one could visualise him—it often occurred to me—as a prehistoric countryman himself, one who was part and parcel of the very earth on which he lived and of the rural community amid which he drew breath. To such a one it was a fitting close that he should be so active to the end; that he should in the Whitsuntide of his last and eightieth year have climbed to the top of his favourite Ingleborough and should have found the last Y.N.U. excursion he attended a specially happy and interesting one. His death on June 25th was sudden and unexpected.

Cheetham realised and we must realise in remembering his personality and work that there were two characteristic limitations which were a condition of his success. The first was his concentration on his native county. He would never let wider claims stand in the way of his attention to Yorkshire. Only one country-wide

society, the Entomological Society, claimed his membership. He lost in this way, but he gained as well. It would surprise many if they knew how often naturalists sought him out at Austwick and left after a stay which enriched their experience of an incomparable district by the help of a uniquely accomplished guide.

The second limitation was his switching from a commercial career and his devotion to natural history alone in the last twenty-four years of his life. He was a textile designer in his earlier life for a Leeds firm, Mellish, Richardson & Co., and his success in this was undoubted. Yet he left this at the comparatively early age of fifty-five and devoted himself to natural history pursuits.

So has passed from us a remarkable character, able, versatile, modest and independent, one who thought for himself and was never so happy as when sharing his knowledge with others. He could not in the fullest sense be called a scientist—he never was a referee or creator of a species in any group—but he was in the fullest sense a naturalist and in his own activities shewed what enjoyment a true naturalist can both obtain for himself and give to others.

A. Malins Smith.

CHRIS. CHEETHAM—AN APPRECIATION

Chris. Cheetham was one of the most notable and colourful personalities in the long history of the Yorkshire Naturalists' Union. For close on fifty years he had been such a regular attender at meetings and, within the recollection of most of us had become such a central figure at all field meetings, that it is difficult to contemplate future excursions without his genial presence in our midst. His devotion to the Union and to the natural history of his native county were the mainsprings of his very existence.

Cheetham excelled in the field. He had an unusually quick eye and an instinct for habitat. Though mosses and diptera were his favourite groups he was an excellent all-round naturalist, interested in all branches of field work and knowledgeable about many. There were few parts throughout the length and breadth of the county which he had not explored at some time or other. His knowledge of the Craven area was unrivalled and one wonders if any man, dead or alive, had been up Ingleborough as often as Cheetham. Naturalists visiting Austwick were assured of a willing guide and cheerful companion wherever they wished to go, for he always welcomed the opportunity of getting out and about. His vitality was remarkable and until his accident of a few years ago seemed inexhaustible. He was as nimble as a goat on the hills and where others affected heavily nailed boots for climbing mountains, C.A.C. invariably wore plimsolls. He was the only Englishman I ever knew whose sartorial equipment did not include a pair of long trousers; shorts were the normal attire, knickerbockers for more formal occasions.

The acquisitive instincts of naturalists are often displayed in the accumulation of literature bearing on their special interests. To acquire a rare book gives as much joy as to discover a rare specimen. But though Cheetham had a useful working library, especially of entomological literature, he was no great bibliophile and his systematics did not find expression in the accumulation of extensive collections of either specimens or books. He was content to discard or to pass on his specimens to others when once these had been determined. His present collection of diptera was a third set, two others having been given to South Kensington and the Leeds Museum. In taxonomic matters he was conservative. He always preferred an old name to a new one, for he had little interest in or sympathy with the type of bibliographical research which so often leads to changes in nomenclature. His contributions to *The Naturalist* were numerous. There is no volume from that of 1906, in which his first published note appeared, up to the current year in which his name does not figure in the index. These publications were usually in the form of short notes and records or contributions to excursion or annual reports. He had little aptitude with the pen; his interest lay wholly in the substance, not in the form of whatever he wrote. He was totally devoid of every vestige of pretension and he spoke on the platform exactly as he did in the field.

Cheetham often struck me as being the most completely happy man I have ever met. No doubt he had his full quota of worries like the rest of us, but he was very rarely other than cheerful and constitutionally incapable of remaining otherwise for long. One of the very first visitors to see him in hospital after his serious accident of a few years ago located him in the crowded ward through his lusty contribution

to the community hymn-singing then in progress. But whilst he was invariably good-natured and cheerful, he could also be a stubborn and obstinate man. In his field work he retained to the end all the enthusiasm of youth, yet in the conduct of Union affairs he often displayed the deep-rooted conservatism of old age. Its committees were sacrosanct in his eyes and even trivial changes of procedure or nomenclature were apt to be violently opposed. Indeed, his interpretation of his secretarial functions did not on occasion preclude his failure to implement executive decisions if these were in conflict with his more strongly-held opinions. Such irregularities were ultimately resolved with cheerful good humour if with total lack of repentance on his part, and the matter was forgotten. Where others might have felt their position untenable or been liable to censure, it was impossible to reach any other conclusion with such a genial official and universal favourite.

Most of his friends, in recalling past meetings with Cheetham, will best remember those occasions on which they were together in the country. He was happiest of all when off to explore some district with someone of kindred interests. To go by bicycle and camp out for a night or two increased the pleasure. He had always been a great cycling enthusiast, his first visits to Austwick by road being made in the days of solid tyres. A spare cycle was always available for visitors to Austwick who had a mind to accompany him—and the ability to keep up with him, for he rarely dismounted save on the steepest of hills. It was characteristic of his reaction to a mere fifty-mile ride that, when already well turned sixty I once met him in Leeds going to deliver some mushrooms to a niece: ' I could'nt find a box to post them in so I jumped on the bike,' was his casual comment on the reason for his journey. I once cycled over into Wharfedale with him from Austwick and above Oughtershaw we ran into thick mist. C.A.C. in trying to cut across to a track leading to Ribblehead, missed the way and we were soon reduced to alternately pushing then carrying the bicycles across moorland, stream and bog; a situation which continued to provoke roars of laughter from him after it had ceased to amuse his more youthful companion. But of all the recollections associated with his cycling, who that ever saw it will forget the delightful sight of Cheetham taking his eighty-year-old, straight-backed mother out for a ride on the tandem round the Austwick lanes ?

Cheetham's death will mark the end of a chapter in Y.N.U. affairs, for by long and close association with the Union he seemed to have become an inseparable part of it. He did everything he could to preserve the continuity of Union activities during the difficult war years and, at a time when the pursuit of natural history sometimes seemed frivolous and irrelevant, his refreshing zest for the pleasures of the country cheered many a heart. A day in his company on moor or in dale was always a tonic, for he was an unforgettable character as well as a born naturalist. No member will be more widely missed or more generally lamented; but the recollection of that stooping figure clad in shorts, the grizzled beard, the lined and weather-beaten face, its lines imprinted more by laughter than by age, will remain a cherished and imperishable memory in the minds of innumerable friends.

W. A. S.

A. A. PEARSON, F.L.S.
(1874—1954)

Arthur Anselm Pearson was born on 12th April, 1874, and died on 13th March, 1954. He was for some years at school in Belgium where, no doubt, he laid the foundation of that familiarity with modern European languages which was to be such an asset in later life, when he was fluent in French, Spanish, German and Italian. On leaving school at the age of 18 he took service with British Belting & Asbestos Ltd., thus beginning an association with Yorkshire which persisted throughout his life. Apart from a year spent at sea, his whole business career was connected with this firm and in building up their export trade and establishments in Europe, especially in Spain. Hence one of the details which gave most pleasure in his golden wedding celebrations was a congratulatory volume containing signatures of all employees of the firm, of which he had become successively Secretary, Director, Joint Managing Director and finally Chairman. Incidentally, his travels on the firm's behalf gave him familiarity with the European scene and opportunity to associate freely with mycological colleagues abroad, especially in France and Catalonia.

Pearson's early recreation was golf and he was led to abandon this in favour of natural history by a fear that the game separated him too much from his family. It is perhaps significant of the transition period that many of the earliest surviving notes, from 1916, refer to collections made on Wimbledon golf links. After an early interest in flowering plants he settled down to a serious study of the higher fungi. At first he seems to have been attracted by the less conspicuous resupinate genera, on which he published a short series of papers between 1921 and 1928, largely in collaboration with Miss E. M. Wakefield. Thereafter his attention became focussed almost exclusively on the Agaricales, a field in which he ultimately became the outstanding British expert. In the taxonomy of this group rapid progress had been made, mainly by French authors, during the present century. Pearson rapidly made

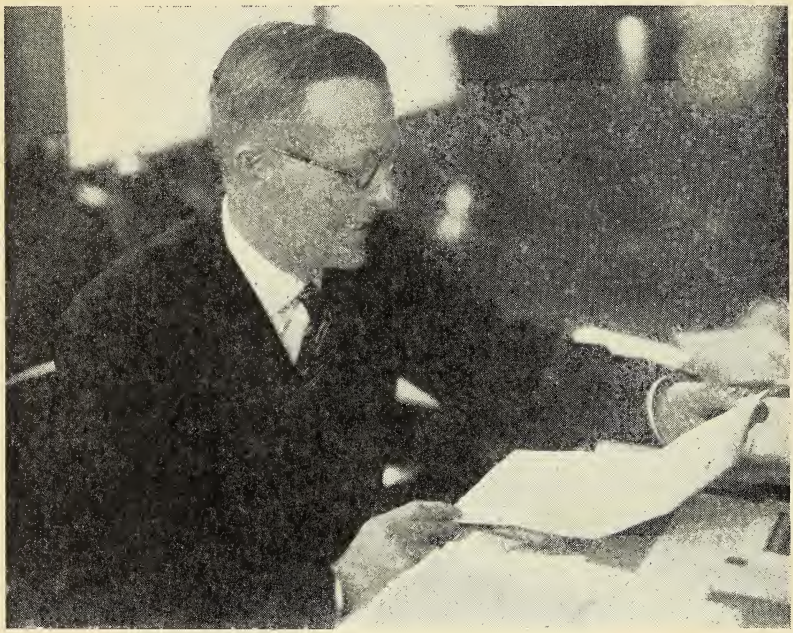

Photo by] [*Marblehouse, London*

himself familiar with their achievements, previously almost ignored in this country, and played an essential part in making them known to British mycologists. After he settled at Hindhead he was living in an area particularly rich in good collecting grounds, and, once his fame became established, he received large numbers of collections for determination each autumn. Hence he was able to accumulate over a long period detailed notes on critical or little-known British species, with a view to the ultimate preparation of a revised British Agaric Flora, based not like it's predecessors on compilation but on personal knowledge of the species. This, alas, never came to fruition but in preparation for it he published of late years first a revised list of good species believed to occur in this country and, in *The Naturalist*, a series of revisions of difficult genera based on personal observations. Of these Boletus, Russula and Lactarius were issued in his lifetime and manuscripts of Inocybe, Mycena and Cortinarius were left sufficiently advanced to be edited for posthumous publication. He had been a member of the Yorkshire Naturalists' Union since 1918, but choice of *The Naturalist* as a vehicle for these works no doubt arose from the closer association he developed with the Y.N.U. during and after the late war, when he was a regular attender at forays and became successively chairman of the mycological section in 1944, and then President of the Y.N.U. in 1946.

In agaric studies Pearson represented the transition phase between the traditional field mycologist, handing on a tradition of species recognised by purely superficial features of colour, form, taste and smell and the modern laboratory student trained to key them out more laboriously but more certainly by well-defined microscopic and chemical characters. In the former rôle he represents the end of the English tradition of species, handed down from Berkeley, who derived it partly from Sowerby, partly from Fries, through M. C. Cooke and W. G. Smith to Massee and Rea. But Pearson was no mycological nationalist and his close association in the field with French workers, especially with René Maire and his successors, amplified by frequent correspondence over difficult collections with all the leading continental specialists from Melzer to Møller, did much to harmonise the English and continental traditions of species. It is most noteworthy, too, that to the end he remained receptive of new ideas and new techniques and was always open to conviction, a rare virtue in elderly naturalists.

Whatever his ultimate standing as a taxonomist, however, those who knew Pearson best will remember him in the field and especially at forays, in which he took such delight. His kindly and generous temperament, coupled with an encyclopaedic memory for ephemeral field characters, made him the ideal foray leader and naturally it was of forays rather than of his unfinished Flora that he remarked a little wistfully, a few months before the end ' Perhaps they will miss the old man after all.' They will.

R. W. G. Dennis

H. WHITEHEAD, B.Sc.
(1878—1954)

Henry Whitehead was born in Leeds on January 15th, 1878. He was a pupil at the Boys' Modern School and afterwards a student at the Leeds School of Science and Technology. His first posts were held in museums; first as Assistant at the Stepney Borough Museum and then as Assistant Curator at the Essex Museum of Natural History, Stratford. During this period he was pursuing his studies of natural science at London University and in 1909 he obtained the degree of B.Sc. with Honours. During the war of 1914-18 he served with the R.A.M.C. in Mesopotamia and India. He joined the Staff of the City of Leeds Training College in 1921 as Lecturer in Science and became Head of the Science Department in 1933, a position which he held until his retirement in 1942. At the College he was primarily concerned with the work in biology and as a teacher he was most successful. He was conscientious and thorough in all he did and his genuine love of his subject, his quiet humour and unobtrusive ways compelled the respect and liking of his students and of all who knew him. He died in Leeds on July 7th, after a short illness.

Whitehead was at one time my close companion and fellow worker in freshwater biology. We became familiar just after his joining the Leeds Naturalists' Club on his appointment to the Biological Department of the Leeds Training College, when our common interest in freshwater faunas brought us together. In the following seven years, we walked and cycled over a great part of Yorkshire in pursuit of our work, collecting material and recording occurrences, and many evenings were spent in his attic laboratory sorting and arranging.

He came to Leeds already well acquainted with fresh waters, having been a working member of the Essex Naturalists' and Queckett Clubs. As an Essex naturalist he published a paper on the natural history and occurrences of leeches in Essex, in 1913, and a paper on British freshwater planarians, in 1922. These two papers showed his quality as naturalist and scientist together, which his friends in Yorkshire learned to enjoy in later years.

During the time of our association, there was much activity in freshwater biology in Yorkshire, both in the Leeds Naturalists' Club and in the Yorkshire Naturalists' Union. Whitehead took part in the ' Survey of the River Wharfe,' beginning in June, 1926, and continuing for a year and a half, out of which we collaborated in the preparation of two papers in the *Journal of Ecology*, 1929 and 1930. Meanwhile, we had collaborated in papers on the biology of mayflies and stoneflies, published in Volume 1 of the *Proceedings of the Leeds Philosophical Society* (1926 and 1928). He continued work that we started on the biology of Driffield Beck which he published in the *Journal of Animal Ecology* of 1935, and *The Naturalist* contains many contributions by him on aquatic insects.

Whitehead was a good man. He never showed illwill towards anyone, of that I am certain. In the course of inquests into and turnings over of personalities that inevitably take place when people are together much, I never heard him speak other than well of people whom we knew. That is a rare happening. He was kind, considerate, thoughtful, generous, in fact, a good companion. When it was my good fortune to meet him again after a lapse of twenty-three years, he was the old Whitehead immediately, with more years but still the youthfulness that was his characteristic. I was with him many times during the following half-year, and had the pleasure of attending two field meetings and an annual meeting of the Union in his company. It was with great pleasure that I saw him as President of the Yorkshire Naturalists' Union in 1951, and knew how he valued his position as a sign of the respect and good will of his colleagues.

The Yorkshire Naturalists have included some good men in their company; one of them was Harry Whitehead. His work is built into the foundations of freshwater biology in Britain.

E. Percival.

BOOK REVIEWS

Pioneer Plant Geography. The Phytogeographical Researches of Sir Joseph Dalton Hooker, by **W. B. Turrill.** Pp. xii+268 with 21 plates and one text-figure. Vol. IV of ***Lotsya—A Biological Miscellany.*** The Hague, Martinus Nijhoff, 1953. Price 19 Dutch guilders.

Hooker, like Darwin and Huxley, began his scientific career on board one of Her Majesty's ships when, at the early age of 22, he sailed to the Antarctic with Sir James Ross Clarke on the *Erebus*, nominally as assistant surgeon but actually as naturalist. His industry during these three years abroad was so great, and his critical appraisal of the phytogeographical problems raised was so acute that he was not yet out of his twenties when Darwin wrote: ' I know I shall live to see you the first authority in Europe on that grand subject, that almost keystone of the laws of creation, geographical distribution.' Darwin's prediction proved true, for though Hooker was first and foremost a taxonomist, yet throughout his long life he was constantly preoccupied with the problems of distribution raised by the floras he studied both during his many journeys abroad and during his work at Kew. His position in the history of botanical science rests therefore largely on his work on geographical distribution, and it is difficult to say whether his achievements in this field are more remarkable for his contribution to its theory or to its data.

In this book Dr. Turrill gives an account of Hooker's major contributions to the study of plant geography and evaluates these in the light of more recent investigations. The material is arranged on a geographical rather than a chronological sequence, chapters being devoted to the Distribution of Arctic Plants, Syria and Palestine, India, Africa, North America, the Galapagos Islands, Antarctica, and Island Floras. Hooker's views on the phytogeographical problems posed by each region are given in his own words by means of a large number of—often lengthy—extracts from his writings, and his conclusions are then considered in relation to subsequent work by botanists in the areas concerned. Having regard to the lapse of time and the new facts and fuller information available, it is remarkable that his broad conclusions nearly all remain valid to-day. Some of the more intractable problems to which he gave so much thought, such as the problem of the population of oceanic islands by overseas migration or *via* vanished land connections, are still *sub judice*. Added interest is also given to this presentation of his views by the fact that his work spans the pre- and post-Darwinian outlook on biological problems.

Hooker's industry and versatility were alike remarkable; his range of detailed information on the floras of so many parts of the world was surely unrivalled. One cannot read these extracts from his lucid writings without being impressed anew by his penetrating mind, equally acute at comprehending taxonomic details or the grand problems of the histories of floras. Much of this very readable and stimulating book was written in the house which Hooker himself occupied during part of his long association with Kew. It is certainly most appropriate that the account should have been prepared by one who so ably maintains the high reputation of the institution which Hooker did so much to make famous.

W. A. S.

Wild Flowers: Botanising in Britain, by **John Gilmour** and **Max Walters.** *New Naturalist,* Vol. 5. Pp. xiv+242, with 45 colour photographs, 27 photographs in black and white and 3 line drawings. Collins, 1954. 25/-.

The avowed intention of the authors of this book is ' to provide an introduction to the British flora for those who are keen on wild flowers . . . designed . . . as a volume for leisurely and intermittent reading in an arm chair, a bed or a train.' The greater part of the book is devoted to a series of chapters giving a discursive account of the plants of well marked types of habitat such as woodlands, chalk downs, moors, marshes and fens, mountains, etc. The book therefore covers well-trodden ground and whilst it admirably fulfils its authors' purpose the more experienced field botanists will find little in it that is new to him. He will on the other hand find little in its statements to criticise, or with which to take exception.

Mr. Gilmour's polished chapter on the history of botanical exploration in Britain is outstanding and every discriminating reader will re-echo the editors' regret that this was not considerably amplified. It is so good that one greatly wishes it had been enlarged at the expense of the succeeding, more stereotyped, chapter on the biology of our flora which has already been well covered in Dr. Turrill's book in the same series.

The monochrome photographs are excellent. W. A. S.

Sea-Birds, by **James Fisher** and **R. M. Lockley.** Pp. xvi + 320 with 9 colour and 68 monochrome photographs; 66 maps and diagrams. Collins. 25/-

This book is a worthy addition to the excellent *New Naturalist* series, but let it be said at the outset that it is not a book for beginners seeking to identify sea-birds; a sound knowledge of the birds which spend most of their lives over the waves is an essential preliminary to the full enjoyment and understanding of this work.

The book deals with those species of sea-birds which breed on the shores of the North Atlantic from the equator to the Arctic, a total exceeding 100 or nearly half the full total of true sea-birds. In general, numbers and distribution are dealt with by James Fisher, a subject in which few would dare to compete with him: the life histories of these wandering birds has been contributed largely by R. M. Lockley. A vast amount of study and field-work (or ocean-work) has been undertaken in the compilation of the matter given, and there has been much correlation in detail with other observations as the long bibliography implies. Yet it is frankly expressed that the study is far from complete; there are wide gaps in the knowledge of the Royal Tern (*Thalasseus maximus*), Ross's Gull (*Rhodostethia rosea*), Sabine's Gull (*Xenia sabini*), and several others. The chapters dealing with evolution, sea-bird members and man, sea-bird movements and navigation I found particularly interesting but many people will find the cannibalistic tendencies of some of the *Larus* gulls rather disconcerting. Maybe there are some phases of sea-bird life which might have had more attention but to have done this would probably have made the work too ponderous.

The many cartographic projections showing species distribution are wonderful but I think it a pity some geographic names were not put in or a full reference map given; not all ornithologists know the position of Melville Peninsula where *Rhodostethia rosea* was found, or of Bear Island to which *Sula bassana* has penetrated; but most people will know that Flamborough Cliffs are in Yorkshire and not in Norfolk as stated on page 93.

The illustrations and production are well up to *New Naturalist* standard and the authors are to be congratulated on turning out a valuable book.

J. P. U.

The Heron, by **Frank A. Lowe.** Pp. 177, with 14 plates (one in colour) and 12 drawings and maps. Collins, *New Naturalist Monograph Series.* 18/-.

The author fulfils the requirements for a monographer, having both studied the species personally in the field for long periods during many years, and the literature on the subject. He first recounts his experiences in a heronry in which, with camera and note book, he has worked from hides in the tree-tops, then passes to physical features, changes in British and world populations and distribution, food and foraging, breeding biology, relations with other species, mechanics of flight and dispersal including migration, and ends with chapters concerning the species in history and folk-lore, and as an object of the chase and as food. The results of the Heron census in Britain organised by Mr. W. B. Alexander are summarised under

drainage areas, with the ' Trent Drainage Area ' separated from the ' Humber Drainage Area,' although the rivers Trent and Ouse form the Humber. In several areas the species has been persecuted in the supposed interests of anglers. No heronries are left in Derbyshire. ' Herons probably eat more eels than all other species of fish together '; and indeed, but for the heron's penchant for eels it is probable that fewer trout would become ' sizeable '. Only once has Mr. Lowe heard of a fish being eaten alive by a heron, to which I can add another—an eel with which I watched a heron struggle for several minutes at the junction of Trent and Ouse. This eel was partially swallowed twice, and finally disappeared down the bird's gullet still struggling, at the third attempt.

In view of the recoveries in England of Scandinavian-ringed herons, it does not seem to be quite a ' reasonable supposition ' that birds seen in winter are from a nearby local heronry.

I can recommend this book to all naturalists and lovers of wild life. The subject is treated exhaustively, even parasites are considered. The book is factual yet very readable, and presents the most picturesque large bird remaining in England admirably. The excellent photographs are by the author and Mr. Eric Hosking.

R. C.

The Observer's Book of British Birds' Eggs, compiled by **G. Evans.** Pp. 212, with 154 illustrations in colour and 26 in outline by **H. D. Swain.** F. Warne & Co. Ltd. 5/-.

Excellent value and of real pocket-size. Most of the eggs figured are easily recognisable, but space considerations permit only one egg of each species to be figured, although those of many species vary considerably. The letterpress is pleasantly written, and briefly gives the status of each species, usual position of nest, and description of eggs. Mr. P. E. Brown contributes a Foreword in which he stresses ' certain cardinal rules ' for the nest-seekers—' don't handle the eggs or disarrange the nest; don't spend more that a minute at the nest, don't disturb the natural cover or leave a track ' and so on. Beginners will be helped by the book to identify many eggs, but the best way will be always to see the birds that produced them, and this book should be taken in conjunction with *The Observers' Book of British Birds* in the same series.

R. C.

Bird Spotting, by **John Holland.** Pp. 190, in 4 vols., with 115 colour plates in all, and text figures. Blandford Press, London, 1954. 1/6 each.

These four volumes together will slip, as they are intended to do, into one lad's jacket pocket. The text is necessarily tabloid and besides a brief description of both sexes and the young of the 186 species dealt with, there are notes on their breeding habits and a brief survey of their distribution.

The selection of the species included appears to be quite arbitrary; the Wood Sandpiper gets in but the Jack Snipe does not, the Icterine displaces the Marsh Warbler and of the commoner species the Ring Ousel, Twite, Redpolls, Grouse and Corncrake, for example, find no place. The compression of the text has been skilfully done and of itself gives rise to little ambiguity. There are, however, regrettable errors of fact. The Green Sandpiper is said to be a passage migrant ' common throughout the British Isles,' the Mallard is said to be double-brooded, without the qualifying statement that this is true only of captive birds.

The plates are the work of Reim Sturrman, a Dutch artist whose nationality may be a clue to the selection of species and races portrayed. They are of somewhat uneven merit, some being extremely good, others wooden, although only one or two might prove misleading. For their intended purpose, they will do little harm by their inaccuracies; ten to fifteen-year-olds will prize them highly and they are very reasonably priced.

A. H.

The World of the Honey-bee, by **Colin G. Butler.** Pp. xiv + 226 with 2 coloured and 38 black and white plates. *The New Naturalist.* Collins, 1954, 21/-.

After this most disastrous season it will be some relief from their cares for bee-keepers to turn to Dr. Butler's stimulating and informative new book. Not only beekeepers, however, but field naturalists and biologists will find much to interest them in this work by the Head of the Bee Department at Rothampstead Experimental Station.

The literature on honey-bees is vast and stretches back into antiquity, indeed the charming chapter headings selected by Dr. Butler are taken exclusively from writers of the seventeenth and eighteenth centuries. Although the honey-bee is the best known and most studied of all insects yet some of the most important increments to our knowledge have been the results of work during recent years, made possible by the application of biological methods of study. These new advances are now incorporated in one volume and not the least in importance are the recent discoveries of Dr. Butler himself, relating to 'queen substance', which seem to explain many details of behaviour previously inexplicable.

A feature of the book are the 89 excellent photographs taken by the author himself which are very fine indeed. The letterpress however is worthy of the illustrations and for the most part is a well-balanced account of many phases of the life of the honey-bee. Perhaps the least satisfactory chapter is the first, on the origin and evolution of honey-bees, which deals too briefly and superficially with the palaeontological evidence. The topics dealing with bees themselves however are admirably treated and include the evolution of social life and the origin of castes, the effects on a colony of the loss of its queen, the lives of queens and workers, division of labour, queen recognition and colony cohesion, odour, swarming, food and foraging, and direction finding. Acarine disease and the destructive wax-moth receive mention but the bee louse (*Braula coeca* Nitz.) is not deemed worthy of inclusion.

It is very fitting that this most fascinating and useful insect should be accorded the dignity of a volume in the *New Naturalist* series and no better account could be provided than that now given us by Dr. Colin Butler.

W. D. H.

The Dancing Bees, by **Karl von Frisch,** translated by Dora Ilse. Pp. xiv + 183. Methuen & Co. 16/-.

This work is recommended by the Book Society and we heartily associate ourselves with this recommendation. It is a most fascinating book, and even through the medium of what must be an excellent translation the kindly genial nature of its author peeps out on every page. The subject itself is one of abiding interest which has attracted many authors, both scientific and poetic, but Dr. von Frisch has added much to our knowledge of the lives and mentality of bees by a series of brilliantly conceived yet simple experiments which can easily be repeated by any apiarist. One wonders which to admire the most, the ingenuity and skill of the experiments, the patience of the observer, or the cogency of the reasoning. The book is written in a popular style and although a little knowledge of science, especially light, is an advantage to the reader, sufficient explanation of the terms used is given in the text to enable any ordinary intelligent person to follow the theme with ease. It is further simplified with many half-tone and line illustrations. It is decidedly a book which one should possess for one's self and should read many times.

G. B. W.

The World of Bees, by **Gilbert Nixon.** Pp. 214 with 17 plates, one coloured. Hutchinson & Co. 12/6.

This is not a textbook nor yet just another book upon bee-keeping, but a pleasing survey of bees in general and in particular. Stingless, bumble, solitary and honey bees are all included with reference to their life histories, structures, habits and habitats. Written primarily for the enquiring layman, the author does not, nor does he claim to, make any startling revelation, but few readers will fail to find something that is new to them, well presented by one who obviously knows and loves his subject. An interesting and worthwhile publication.

F. H.

This Fascinating Animal World, by **Alan Devoe.** Pp. x + 306. Many line drawings. Arthur Barker Ltd. 12/6.

Why are some birds' eggs plain coloured and others speckled ? Can a fish hear ? Do you know ? Perchance you think so, but read what is in this book on the subjects; the answers may be very different to yours. The book is interesting reading for it provides answers to many problems which beset adults as well as children. It can be picked up and opened at any page and the answer to a particular query found almost immediately. The numerous line drawings are delightful and the book is one for every naturalist to possess.

J.P.U.

Handbooks for the Identification of British Insects. Published by the Royal Entomological Society of London. Vol. 1, part 2. **Thysanura and Diplura,** by **M. J. Delany,** 1954, 7 pp., 15 figs. 2/6. Vol. 5, part 9. **Coleoptera (Lagriidae to Meloidae),** by **F. D. Buck,** 1954, 30 pp., 63 figs. 6/-.

It is a long time since the primitive orders of insects received systematic treatment in this country so Mr. Delany's synopsis of the Thysanura and Diplura is most welcome. Nine species of the former and eleven of the latter are included as British.

Fifteen small families of beetles formerly included in the old suborder Heteromera are well treated in Mr. Buck's contribution. The difficult genus *Anaspis* Mueller, is one of those included and this should prompt coleopterists to hunt out the unnamed specimens in their reserve boxes.

W. D. H.

The Insect Legion, by **Malcolm Burr.** Pp. 314 with 27 plates. James Nisbet & Co., London, 1954. 21/-.

Here we have the second and extended edition (the first was published in 1939) of what is undoubtedly the best of all 'popular' books on insects written in the English language.

As in the first edition this one is divided into four parts covering seventeen chapters. In 'Insects Themselves' (Part I) Dr. Burr provides us with a very wide and accurate survey of the insect world and at the same time enlivens his writing with personal experiences of entomology and entomologists in Europe, South America and Africa. In 'Insects and Man' (Part II) the author deals with the more practical side of entomology and gives up-to-date information on such insect-borne diseases as plague, yellow fever and malaria. The economic side of entomology is also fully dealt with and we are shown that insects inflict material damage which costs an enormous sum each year. This damage, however, is to some extent offset by the usefulness to man of other insects, though the vast majority of the insect population is neutral. The geological history of insects is summarised in Part III, 'A Sense of Proportion'. The final portion of the book is a most interesting history of Ancient and Modern Entomology.

The very few errors noted in the 1939 edition have been corrected and in preparing this edition Dr. Burr writes with a vigour and enthusiasm which is only matched by the grandeur of his subject. No entomologist could read this book without both pleasure and profit and it should be on the shelf of every entomologist whether he be professional or amateur.

T. B. K.

Freaks and Marvels of Insect Life, by **Harold Bastin.** Pp. 248 with 25 line drawings by Jane Burton and 20 plates of monochrome photographs. Hutchinson & Co., 1954. 16/-.

In his foreword, Mr. Laing expresses the view that 'readers of this book with receptive minds, eyes in their heads and capable hands will find plenty of fields where valuable research work may be done.' How true!

Mr. Bastin has produced a most interesting volume which will amply repay the attention of any naturalist whatever his own particular province. The text is written in an easy style and shows clearly the author's wide knowledge of his subject. After introducing the general features of the insects as a class in chapter one, all aspects of their lives and peculiarities are exposed to us in the succeeding chapters.

It might have been more useful if certain of the line drawings had been more adequately labelled. In particular one thinks of the figure of the face of a caterpillar on p. 47. Also, some idea of the scale of the drawings and photographs would increase their worth. Much time and trouble would be saved if the line drawings were placed nearer to the text which they illustrate or, alternatively, some system of cross reference should be introduced.

These criticisms are, however, trivial—the subject matter of the book is first-class and stimulating, and the photographs are clear. There is 'Something for All' in this book, whilst the introduction of a glossary where one can find the necessary scientific names of the insects described is useful.

E. D.

Beasts of the Field, by **L. Harrison Matthews.** Pp. 35 with 26 monochrome photographs and 8 in colour. **Flowers of the Seaside,** by **Ian Hepburn.** Pp. 36, with 16 monochrome photographs and 17 in colour. Collins, 1954. 2/6 each.

These books are in the *Country Naturalist Series*, generously illustrated and are remarkably good value. The monochrome photographs have been expertly taken, and while those in colour have been equally well done in the first place, chiefly by John Markham, their printing is indifferent, far too many suffering from an excess of blue.

Plants of the coast are often spectacular and abundant, attractive alike to plant-hunters residing inland and holiday-makers with leisure and a love of flowering plants. Over sixty species are listed and fully described. Armed with this handy little book, the visitor to the seaside will find a new world in which to explore, and as flowering periods are given at the end of each description, one may read in advance what to expect.

The author of *Beasts of the Field* is Director of the Zoological Society of London and a recognised authority on British mammals. No fewer than 34 species of animals are described. Part of the book's title has ruled out certain familiar creatures of the English countryside. Yet one of the twelve species of British bats is given a page, and both noctule and Natterer's bats are admirably portrayed. No fewer than five foreign species of deer are mentioned; but there is not a line about the ground-frequenting grey squirrel. The information on the rodents and carnivores is so full and generous that one wishes the author might have extended his field to caves, woods and buildings in order to accommodate the remaining bats, both squirrels, and the edible dormouse.

J. A.

Culture and Diseases of Game Fishes, by **H. S. Davis.** University of California Press, 1953. Pp. 332 with 55 figs. 32/6.

This is an American work, dealing with American fishes. ' Game fishes ' is a somewhat catholic term which embraces not only salmon, trout and grayling—which have their British counterparts—but also catfish, species of bass, pikeperch and pike, none of which would escape the mildly approbrious appellation of ' coarse fish ' over here and which have not yet come to be regarded in this country as meet for cultivation except in a few private waters like those at Woburn.

The book comprises a compendium of the methods of stripping the females of their eggs, fertilisation, incubation and the care of fry and fingerlings and there is a chapter devoted to the most efficient utilisation of farm ponds to produce not only sporting fishes but a food crop. It is noteworthy that the author advocates the combination of both a foraging and a predatory species to produce the maximum yield.

Parasites and diseases are dealt with categorically as far as they affect hatcheries and ponds and the British piscatorialist will for the most part feel all too much at home in this section of the book but may glean some comfort from the very thorough review of up-to-date methods of prophylaxis.

A series of appendices illustrating various practical devices and a most comprehensive bibliography complete a book which will be of the greatest interest and service to all who are interested in the conservation and artificial culture of fish for sporting, food or amenity purposes.

E. H.

Introducing Animals with Backbones, by **William and Helena Bullough.** Pp. 72, text figure. Methuen & Co., London, 1954. 8/6.

As a companion to their earlier *Introducing Animals*, this child's guide to the invertebrates was written by Professor and Mrs. Bullough for their two children, aged seven and ten. The main theme is the evolution of the vertebrates but the authors digress from time to time to treat of specialised forms and adaptations.

Of necessity, the account is simplified, but to the extent of employing so many half-truths that one feels that the better course would be to defer the child's ' introduction ' until such a time as it is capable of a fuller understanding and so to obviate the need for some unlearning which can only cause confusion and loss of confidence, as well as waste time.

The authors appear to be masters of the art of the *non sequitor*, the punctuation is far from exemplary and in places their English is grotesque, e.g. ' and so it is with the birds and all the other hairy mammals.'

A. H.

Tissue Culture, by **E. N. Willmer.** Pp. 137. Methuen's Monographs on Biological Subjects. 9/6.

This is a revised version of the book written by Dr. Willmer in 1931. The text has been brought up-to-date and 410 references are cited.

In this small volume there is a comprehensive survey of the field of tissue culture of animal cells. The subject is discussed under the two main headings—organised and unorganised growth. The former includes descriptions of the techniques used, growth characteristics, and metabolism of tissue culture cells. The final chapter on organised growth contains an interesting discussion of the powers of differentiation retained by cells when isolated from the entire organism and placed in culture.

The general biologist will find this book difficult reading, but there is an excellent glossary which contains most of the technical terms used in the text.

E. R.

Indoor Aquaria, by **D. Latimer-Sayer.** Pp. 185 with 93 plates. Teach Yourself Books, E.U.P. 6/-.

The title of this little book is somewhat misleading. To the old-fashioned naturalist the word aquaria suggests inexpensive tanks and jars containing water in which he would expect to find living examples of plants and animals found in our ponds and streams. The ' end product ' in this work is fish—cold water and tropical.

The book is intended for beginners and contains a great deal of well arranged practical information. The author, who is an artist, gives a number of diagrams of various types of apparatus. Clear descriptions with many illustrations of plants and fish are given with practical hints on the rearing and breeding of the latter. A chapter deals with enemies, diseases and their treatment.

H. W.

Hardy Rhododendrons, by **Frederick Street.** Pp. 192 with 31 plates, 7 in colour. Collins. 15/-.

Hardy Rhododendrons claims to be written in a style interesting to all who like a garden. It is in fact a book for the specialist, for the owner of a garden large enough to grow the hardy hybrid varieties; parts of the book are more general in their appeal, but too much space is given up to lists of named varieties and there is more than a hint of the nurseryman's catalogue. The history and development of the hardy hybrid is given in detail.

Part 2, which deals with the growing of Rhododendrons in general, is very useful and interesting, especially the chapter on pests and diseases, real and imaginary. There are a number of illustrations which fail to do justice to the plants figured: the black and white are more pleasing than the ones in colour. A useful book for the Rhododendron grower.

C. M. R.

Adventure of the World, by **James Fisher.** Pp. 68, $13 \times 9\frac{1}{2}$, with copious coloured illustrations under the art editorship of F. H. K. Henrion. Rathbone Books, Adprint House, London, W.1, 1954. 10/6.

The first two parts of this remarkable book give a pictorial account of the history of the world in time, of the main stages of geological and biological evolution, and of the forces of nature which have been instrumental in shaping its surface. The third part illustrates man's relation to his environment and how he has adapted and exploited his different environments to serve his own ends. The story is well and simply told, but the copious coloured drawings, sketches and maps are the outstanding feature of the book. These are arresting and both in conception and execution are of a very high order, combining admirably visual explanation with artistic merit. An ideal gift-book for a schoolboy or schoolgirl.

Filmstrip. Botany—Plants and their Food. 33 frames. Order No. 5054. Educational Productions Ltd., East Ardsley, Yorkshire. 15/- (including Notes).

The photographs and diagrams are well reproduced and very clear. A few could have been improved by the addition of superimposed labels to indicate more specifically features mentioned in the text. Owing to the wide range of plants covered the strip is suitable mainly for revision after a fairly intensive study of the topic. It is not easily adaptable for use in actual teaching of the processes and mechanisms involved, but is excellent for revisionary purposes.

S. A.

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Circular No. 539

Yorkshire Naturalists' Union.

President:
Rev. T. BASIL KITCHING, F.R.E.S., Howden.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Assistant Secretary:
K. G. PAYNE, B.Sc., A.R.C.S., York.

Hon. Treasurer:
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

THE SPRING FORAY

of the Mycological Committee will be held at

GRANTLEY HALL

From APRIL 22nd to 26th, 1954

Chairman: Dr. C. J. P. LA TOUCHE, Leeds.

Convener: Miss J. GRAINGER, Meltham.

Recorders: Dr. J. GRAINGER, Ayr; W. G. BRAMLEY, Pickering; Miss E. M. BLACKWELL, Kirkburton.

Accommodation is at Grantley Hall Adult College, near Ripon. The charges will be:

(1) For residents in the West Riding Administration area, £1 15*s.* for the first two days and 15/- per day for the other days, making £3/5/- for the whole four days.

(2) For non-residents in this area, £2/10/- for the first two days, and 17/6 per day afterwards, i.e. £4/5/- for the four days.

Application should be made to the Bursar, Mr. L. Aspinall, *before April 6th* as any vacant places after that date will be made available for other Courses.

Residents in County Boroughs who wish to apply for remission of fees to the West Riding level should ask Mr. Aspinall for information when booking.

MICROSCOPIC WORK.—There are excellent facilities available but members should bring own microscopes and slides, etc.

BOOKS.—Members having copies of the standard works on Micro-Fungi should please bring them along.

The party will assemble for the evening meal (7-0 p.m.) on Thursday, April 22nd.

GROUND TO BE WORKED.—There are good woodlands near to Grantley Hall and Fountains Abbey Woods are within easy reach.

TRANSPORT.—Any member not coming by car should inform Mr. Aspinall, who will arrange transport from Ripon.

In case of any other difficulties members should write the Secretary, Miss J. Grainger, Wilshaw, Meltham, Huddersfield.

The **Executive** meet in Leeds on May 8th, 1954.

CIRCULAR No. 540

Yorkshire Naturalists' Union.

President:
Rev. T. BASIL KITCHEN, F.R.E.S., Howden.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Assistant Secretary:
K. G. PAYNE, B.Sc., A.R.C.S., York.

Hon. Treasurer:
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

Divisional Secretary:
H. M. RUSSELL, F.R.E.S., 31 Stainbeck Lane, Leeds 7.

The TANFIELD MEETING has been altered from May 29th to July 10th.

The 540th Meeting

WILL BE HELD AT

AUSTWICK

V.C. 64

Sat. JUNE 5th to Mon. JUNE 7th.

HEADQUARTERS.—The Traddock Guest House (Hostess: Mrs. Joan Burniston), Austwick via Lancaster. The charge is 16/- per day and members must book their accommodation, etc., direct with The Traddock Guest House. Tea on Monday, 5-0 p.m. Afternoon Tea 2/6. High Tea 5/-. Members must order this beforehand.

MAP.—The one-inch Ordnance Survey (New Popular Edition), Sheet 90 Askrigg and Settle, covers the area to be visited.

TRAVEL FACILITIES.—Austwick is three miles from Clapham Station. Buses run hourly from Skipton, via Settle, at the half hour, and from Lancaster, via Ingleton, at a quarter to the hour.

THE DISTRICT.—Austwick has long been known to Naturalists; the earliest notes were those of John Ray, who visited the area around 1660. He saw *Polygonum*

viviparum L. in 'a mountainous pasture 1½ miles from Wharfe on the footpath to Settle'. (The plant can be seen there still.) In his visits around Settle and Ingleborough he saw *Draba incana* L., *Saxifraga oppositifolia* L., *Thlaspi alpestre* L., *Sedum villosum* L., and *S. Rhodiola* D.C. It was in Settle Ray met many interested in plants; he mentioned Lawson, Willisel, Lister and Dr. Richardson. Evidently the earliest Naturalists were botanists and it was not until around 1820 that Wm. Smith drew attention to the various geological strata and Phillips published his *Rivers, Mountains and Sea Coast of Yorkshire* in 1853. Then we find visitors being drawn to the Austwick area to study its geological features; later on its glacial history drew their attention to the perched blocks on Norber.

BOTANY.—Although the division of the area into limestone and silurian grit is usually taken as dividing the plants requiring acid soil from those needing alkaline soil, it is necessary to look at the nature of the soil covering due to glaciation when examining the vegetaion. On Oxenber the north-west ascent is covered with drift grit material which covers the limestone and we find Heather here, the south has the limestone exposed and has the normal limestone flora. A walk up Crummackdale shows on the west a limestone area, Long Scar, which was overrun by the latest glacier and has on it boulders of Yoredale limestone carried from Ribblesdale and lower down the 'Perched Boulders' of Silurian grit pushed up from their lower source. On the east side, Moughton, is very different. Evidently, prior to this glaciation the extensive plateau had an ice cap which interfered with the flow of the ice moving down Ribblesdale and over Sulber, and later when the glaciers started to melt, the water running between the ice and the hillside, took the easy path over the Moughton plateau, leaving masses of rounded grit boulders and filling the limestone crevices with a fine deposit which, when it dried out, is almost like porcelain; this and a considerable thickness of drift soil and sand made a muddy surface providing an area where marsh plants, rushes and cottongrass grew and formed a considerable depth of peat. On this the heather type of plants found a home above the limestone of the summit. It may be seen that the drift gradually accumulated on flat areas, and here the useless Matgrass finds a home, whilst in a wide valley-like area the drift is much deeper and here Bracken has found a place. Where the limestone has been cleared we find the crevices hold many woodland plants like Wood Anemones, showing that a wooded area was later present. Many species of ferns grow here, the most interesting being the Rigid Buckler and Limestone Polypoddy, the Holly Fern was fairly plentiful but the gardens in the village tell the story. The bold cliff to the south has a fine growth of the Seashore Bladder Campion and a small quantity of Spiked Veronica. The village stream carries much vegetation, especially the dense-leaved Pondweed, and the district has a rich flora of mosses, Thuidia being plentiful, whilst the lichens are abundant, especially some species of Parmelia. The limestone plants will be most attractive, Rockrose, Salad-Burnet, Wild Thyme, Small Scabious, Bloody Cranesbill, Mossy and Three-fingered Saxifrage and Blue Sesleria grass. Others seen less often are Hoary Draba, Hippocrepis, Spring Potentilla, Carline Thistle, Autumn Gentian, two species of Daphnes, Primroses and Oxlips. On Moughton we have the finest stand of Juniper in Yorkshire which should be walked over to see if there is any reason for the abundance of this widespread growth; at the summit, 1300 ft. O.D., the plants are quite stunted, looking much younger than their age when the growth rings are counted. The area of the Juniper has been considerably reduced since 1900 by the death of the plant on the Long Scar of Ingleborough and the Thieves Moss area.

ORNITHOLOGY.—R. Chislett: Austwick is close to moorlands and to limestone hills and gills, and is one of several centres that we have visited in the Craven country which have always proved interesting. Agricultural land falls away southward and we shall expect to hear the Corncrake. On Austwick Moss Short-eared Owls often occur, and generally the birds characteristic of the Craven hills and gills can be confidently expected. Reports of the meeting held in 1940 should be consulted.

D. Byles and W. K. Mattinson add: On Austwick Moss such birds as the Reed Bunting, Lesser Redpoll and Sedge Warbler should be observed. The Grasshopper Warbler used to be a regular visitor, but recently has only been heard on rare occasions. The Short-eared Owl is sometimes seen hawking over the moss. In the meadows and pastures in the valley of Austwick Beck, Snipe, Sandpipers, Lapwing, Curlew and Redshank nest and Dippers and an occasional Kingfisher by the stream.

Last year a Heron nested in a neighbouring plantation. There are also a few pairs of Oystercatchers nesting on the gravel heaps dredged from the Beck. It is not uncommon for one or two Corncrakes to be heard in the district. Of the smaller birds, Yellow Wagtails, Wheatears, Willow Warblers and Meadow Pipits are abundant and Stonechats and Whinchats may be seen in suitable places.

On the wooded slopes of Oxenber and Wharfe Wood perhaps the most noteworthy birds are the Redstarts, which have shown a most welcome increase in numbers in recent years. Woodpeckers also seem to be on the increase. The commonest is the Green Woodpecker, but the Greater Spotted Woodpecker should be looked for. Occasional Woodcocks and Nightjars are to be seen in this area.

On the higher ground such as the limestone plateau on the tops of Norber and Moughton, Ring Ouzel and Golden Plover should be seen nesting, as well as Curlew and Lapwing, but it is a notable fact that these two birds are tending more and more to nest on the cultivated ground at a lower level.

Ravens are sometimes to be seen in this area and among the birds of prey Little Owls, Merlin, Buzzards and Peregrine Falcons are sometimes seen.

There is a colony of Blackheaded Gulls nesting on Austwick Common on the hills towards the Lancashire boundary.

CONCHOLOGY.—Mrs. E. M. Moorhouse: When the Y.N.U. visited Austwick in 1940 twenty-seven species of molluscs were recorded. It is, therefore, reasonable to expect that more can be added to those already on the list.

Pyramidula rotundata Drap.
P. rupestris Drap.
Vitrea alliaria Mill.
V. pura Alder.
V. cellaria Müll.
V. rogersi Woodward
V. nitidula Drap.
Vitrina pellucida Müll.
Sphradium edentulum Drap.
Helicella itala L.
Hygromia hispida L.
H. rufescens Pennant
H. granulata Alder.
Arianta arbustorum L.
Helix nemoralis L.
Jaminia secale Drap.
Cochlicopa lubrica Müll.
Ena obcura Müll.
Clausilia cravensis Taylor
C. bidentata Ström.
Agriolimax agrestis L.
A. agrestis v. *reticula* Moqtan
Limax maximus L.
Arionater v. *atterima* Taylor
Ancylus fluviatilis Müll.
Succinia putris L.

ENTOMOLOGY (Coleoptera).—H. M. Russell, F.R.E.S.: The area appears to have received very little attention from the Coleopterist, and would, I feel, amply repay close investigation. Such places as Austwick Moss, Lawkland Moss and the lanes in and around the village should yield many species. During June 1953, I took the following: *Elater balteatus* L. (Austwick Moss), *Coccinella hieroglyphica* L. (Moughton Fell) and *Plateumaris discolor* Panz. (Austwick Moss). The latter beetle was discovered by the late T. Stainforth, B.A., B.Sc. (Lond.), and Mr. C. A. Cheetham, F.R.E.S., on August 1st, 1944.

DIPTERA.—Chris. A. Cheetham: This section of the insect fauna of Austwick has been well worked mainly by the frequent visits of the late Dr. F. W. Edwards of the British Museum of Natural History.

It will be best to consider isolated areas. The marshy field below Nappa Scars has proved very interesting, in 1924 a Scandinavian insect, *Tipula coerulescens* Lack., was found here and this seems to be its only English station. The first capture of a new British species, *Tipula cheethami* Edw. was made here and has since been found to be widely distributed where vertical rock faces are covered with wet moss. Another Scandinavian species new to Britain was caught here in 1927, *Dicranomyia aperta* Wahlgr. It has since been only found in Morayshire. The two species of *Orimarga, virgo* Zett. and *attenuata* Walk. occur here. On the damp soil the Stratiomyides, *Oxycera nigripes* Verr., *pygmaea* Fln., *pardalina* Mg. and the small spotted Dolichopod, *Hydrophorus nebulosus* Fln. are found amongst the grass.

Another place with interesting insects is Austwick Moss, where several species of Tipula are to be found, the commonest is *subnodicornis* Zett., once called *plumbea* F. A species previously named *Tipula diana* Mg., now known as *Prionocera turcica* Fab., is plentiful and this is one of the few places in England where the

other species, *P. subserricornis* Zett. has been caught. The mosquito *Anopheles bifurcatus* L. is too plentiful. *Corethra plumicornis* F. is widespread, but *C. pallida* F. has not been seen lately nor has *Metriocnemus fuscipes* Mg. The curious larvae of *Phalacrocera replicata* L. feed on submerged Hypnum moss and the insect is plentiful. One of beautiful species with larvae in the bogpools is *Idioptera*, both species *pulchella* Mg. and *trimaculata* Zett. are to be found. Amongst large Syrphids *Sericomyia borealis* Fln. and *lappona* L. are often plentiful and *Helophilus hybridus* Lw. has been taken, though *H. pendulus* is the common species. The bee-like *Volucella bombylans* L. and the less hairy *V. pellucens* L. hover around with the hairy *Eristalis intricarius* L. The attractive *Ischyrosyrphus glaucius* L. is generally abundant.

FRESHWATER BIOLOGY.—The streams in the district have been examined and the contents noted for a period of at least 25 years. This was commenced by E. Percival and H. Whitehead and continued by the latter after Percival left for New Zealand. The type of stream and of the vegetation possibly induced workers to revisit the area and so increase the number of species in the following lists.

MAYFLIES

Baetis bioculatus, B. pumilus, B. rhodani, B. scambus, B. tenax, Caenis rivulorum, Ecdyonurus dispar (longicauda), E. torrentis, E. venosus, Ephemera danica, Ephemerella ignita, Habrophlebia fusca, Heptagenia lateralis, Leptophlebia vespertina (Meyeri), Paraleptophlebia submarginata, P. cincta, Procloeon rufulum, Rhitrogena semicolorata.

CADDISFLIES

Colpotaulius incisus, Limnophilus lunatus, L. elegans, L. auricula, L. luridus, Anabolia nervosa, Stenophylax stellatus, Micropterna sequax, Halesus radiatus, H. auricollis, H. guttatipennis, Drusus annulatus, Ecclisopteryx guttulata, Chaetopteryx villosa, Sericostoma personatum, Goera pilosa, Silo pallipes, Odontocerum albicorne, Leptocerus nigronervosus, L. bilineatus, Mystacides nigra, M. azurea, M. var. *albicorne, Polycentropus flavomaculatus, Cyrnus trimaculatus, Tinodes waeneri, T. dives, Psychomyia pusilla, Philopotamus montanus, Wormaldia occipitalis, Rhyacophila dorsalis, R. septentrionis, R. munda, Agapetus fuscipes.*

STONEFLIES

Perlodes mortoni, Perla cephalotes, P. carlukiana, Isoperla grammatica, Chloroperla torrentium, Leuctra geniculata, L. inermis, L. hippopus, L. fusciventris, Protonemura meyeri, Amphinemura sulcicollis.

MEETING.—Tea at headquarters, The Traddock Guest House, Austwick, at 5-0 p.m. on Monday, June 7th. This will be followed by a meeting for the election of new members and to receive reports from the various sections on the week-end's work.

No definite routes have been arranged as the weather will decide this. A note will be left at headquarters giving the daily arrangement.

EXECUTIVE.—Will members of the Executive please note that there will be a meeting in the University, Leeds, on May 8th, to consider financial matters.

The Entomologists intend to meet at Tarn House, Malham, from June 12th to 19th.

The Next Meeting is at Market Weighton Canal, Saturday, June 19th, 1954.

Circular No. 541

Yorkshire Naturalists' Union.

President:
Rev. T. BASIL KITCHEN, F.R.E.S., Howden.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Assistant Secretary:
K. G. PAYNE, B.Sc., A.R.C.S., York.

Hon. Treasurer:
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

Divisional Secretary:
Miss EVA CRACKLES, 143 Holmgarth Drive, Bellfield Avenue, Hull.

The 541st Meeting

WILL BE HELD AT

NORTH CLIFFE

for the Market Weighton Canal and South Cliffe Common

V.C. 61

On SATURDAY, JUNE 19th, 1954

HEADQUARTERS.—Mr. Burstall's house, Cliffe Lodge, Hotham, E. Yorks. Cliffe Lodge is half a mile east of North Cliffe, along the road to Holme-on-Spalding Moor. Drinks of tea will be provided at Cliffe Lodge at tea-time. **Please bring sandwiches.**

TRAVEL FACILITIES.—Times given below should be verified.

Train Service:

Hull	9-40 a.m.	York	10-10 a.m.
Market Weighton	10-20 a.m.	Market Weighton	10-42 a.m.

Bus Service (East Yorkshire Motor Services, Limited.)

Hull	9-30 a.m.	Leeds	8-5 a.m.
Market Weighton	10-25 a.m.	York (Piccadilly)	9-25 a.m.
		Market Weighton	10-22 a.m.

Return Services:

Train Service:

Market Weighton	6-11 p.m.	7-54 p.m.	Market Weighton	5-49 p.m.	8-22 p.m.
Hull	6-46 p.m.	8-25 p.m.	York	6-25 p.m.	9-10 p.m.

Bus Service:

Market Weighton	6-22 p.m.	7-22 p.m.	Market Weighton	6-25 p.m.	7-25 p.m.
Hull	7-17 p.m.	8-17 p.m.	York (Rougier St.)	7-30 p.m.	
			,, (Piccadilly)		8-22 p.m.
			Leeds	8-40 p.m.	

MEETING PLACE.—Cliffe Lodge, 10-45 a.m. Will members arriving at Market Weighton by train or bus, please communicate with the Divisional Secretary by Saturday, June 12th, and an effort will be made to arrange transport. Will those members with cars who are willing to provide transport from Market Weighton to Cliffe Lodge, also kindly communicate with the Secretary by June 12th. Others should proceed direct to Cliffe Lodge.

MAP.—One-inch Ordnance Survey, New Popular Edition, Sheet 98.

PERMISSIONS.—Permission to visit Low Plantation and adjacent Common has been kindly given by Mr. Smithson. Permission to investigate South Cliffe Common and any other part of her property in the area has been given by the Right Honourable the Viscountess FitzAlan. Members are reminded that no dogs may be brought on to the ground to be visited and are requested to be particularly careful not to leave gates open.

ROUTE.—Mr. Burstall has kindly agreed to lead the Ornithologists. If the necessary permission is obtained, it is suggested that it may be profitable for botanists and entomologists to cross South Cliffe Common, via Bunny Hill to Carr Farm and Wholsea Grange and then follow the Market Weighton Canal to East Common. It may be of advantage if some workers concentrate on investigating Low Plantation and the adjacent East Common.

THE DISTRICT.—The area to be visited is a tract of sandy alluvium with woods, sandy fields, marl pits and marshy ground. Details concerning the geology of the area may be found in the following books: *The Geology of the Country between York and Hull*, Mem. Geol. Survey; *Geological Rambles in East Yorks.*, Sheppard; *Geology of Yorks.*, Kendall and Wroot; *Glacial Geology of Holderness and Vale of York*, Melmore; and also *The Naturalist*, 1909, pp. 232-234.

NATURAL HISTORY.—As far as Flowering Plants, Mosses and Insects are concerned the area does not appear to have been well worked. However, for records made in the Hotham Carrs and Duck Nest areas see the report of the 1953 North Cave Meeting in *The Naturalist* (October-December issue); Circular No. 215, May, 1909, has notes on Flowering Plants, Mosses and Hepatics, Insects and Birds to be found in the area generally, and a full list of Land and Freshwater Mollusca.

MEETING to elect new members and to receive reports of the day's findings will follow tea at 5 p.m. at Cliffe Lodge.

Next Meeting.—Goathland, July 3rd, 1954.

CIRCULAR No. 542

Yorkshire Naturalists' Union.

President:
Rev. T. BASIL KITCHEN, F.R.E.S., Howden.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Divisional Secretary:
K. G. PAYNE, B.Sc., A.R.C.S., York.

Hon. Treasurer:
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

The 542nd Meeting

WILL BE HELD AT

GOATHLAND

V.C. 62

On Saturday, JULY 3rd, 1954

HEADQUARTERS.—The Firs Private Hotel, Goathland. This is at the west end of the village by the church and near the descent to Mallyan Spout. Members wanting High Tea should notify the Divisional Secretary (West Dene, Manor Heath, Copmanthorpe, York, telephone York 6358) by the Monday preceding the meeting. Other members will be assumed to require only Afternoon Tea.

Members are reminded of the possibility of spending the weekend in Goathland. Terms at The Firs Hotel are £1 per day and 14/- Bed and Breakfast. There are a number of other hotels including The Mallyan Spout Hotel.

MEETING PLACE.—Headquarters at 12-15 p.m. Word will be left as to the route or routes being followed.

TRAVEL FACILITIES.—Train.—Goathland is readily reached from Leeds, York, Scarborough and Whitby. The rail journey between Pickering and Goathland is a particularly attractive one, though the statement made not infrequently that it is the finest in England is a matter of opinion.

Departures of useful trains are as follows:

Outward			*Return*		
Leeds	dep.	9-22 a.m.	Goathland ...	dep.	7-19 p.m.
York	,,	10-15 a.m.	Malton	,,	8-07 p.m.
Malton	,,	11-0 a.m.	York	,,	9-04 p.m.
Goathland ...	arr.	11-49 a.m.	Leeds	arr.	10-02 p.m.
Scarborough ...	dep.	10-20 a.m.	Goathland ...	dep.	7-19 p.m.
Malton	,,	11-00 a.m.	Malton	,,	9-01 p.m.
Goathland ...	arr.	11-49 a.m.	Scarborough ...	arr.	9-31 p.m.
Whitby	dep.	9-20, 11-40 a.m.	Goathland ...	dep.	6-37 p.m.
Goathland	arr.	9-48, 12-08 p.m.	Whitby	arr.	7-02 p.m.

Bus.—West Yorkshire buses on the Leeds—York—Malton—Whitby route pass through Goathland.

PERMISSIONS.—We are indebted to Mr. Harker, of ' Weathercote ', Goathland, for permission to go in the woods between Mallyan Spout and Beck Hole. No dogs must be brought.

PREVIOUS MEETINGS.—The Union has previously been in the area as follows: 1895 Hole of Horcum; 1903, Goathland; 1906, Beckhole, and 1925 and 1930, Egton. Randy Mere, Beckhole and Goathland were visited at the last meeting mentioned (*The Naturalist*, 1931).

TEA.—5-0 p.m., followed by a meeting for the presentation of Sectional Reports and the election of new members.

THE DISTRICT AND ITS NATURAL HISTORY.—Goathland Dale lies at 200-500 feet O.D., the surrounding moors rising to 950 feet at Lilla Cross and to over 1,000 feet O.D. four miles to the west. The valleys are notable for the streams, the various branches of Wheeldale Beck and Wheeldale Gill (as West Beck) joining Eller Beck near Beckhole to form the Murk Esk and for the waterfalls of Nelly Ayre Foss on the former and Thomasson's Force and other on the latter. In places the valley sides are steep and wooded. Newton Dale running to the south is considered to have been cut by the flow of water from glacial lakes in Goathland Dale and Wheeldale. At its head and only two miles south of Goathland is the interesting Fen Bog with plenty of Sweet Gale and Narthecium. Cranberry, *Potentilla palustris* (L.) Scop., Parnassia, Menyanthes, *Triglochin palustris* L., *Schoenus nigricans* L., *Rhynchospora alba* (L.) Vahl. are also to be found. *Genista anglica* L., *Trientalis* and *Listera cordata* (L.) R. Br. should also be looked for. By the main road to Pickering is the remarkable Hole of Horcum, where *Chamaepericlymenum* (=*Cornus*) *suecicum* (L.) Aschers. and Graebn. grows in quantity and poses some problems.

Merlins are not uncommon about Goathland and Pied Flycatchers, Grey Wagtails and Sandpipers occur. Ring-Ousels, Golden Plover and Curlew are plentiful on the higher ground.

Mr. Whitehead mentions that H. Britton and J. M. Brown have collected insects in the district. Fifteen species of caddis fly and 12 of stonefly are recorded, including the remarkable *Capnia vidua*. Dragonflies are numerous, especially at Darnholme and at the Tarn near the Golf Links, but no list of species is available.

A series of articles on the Natural History of Goathland was published in *The North-Western Naturalist* as follows: (I) ' The Geology and Topography,' by D. J. Bevan, in Vol. XIV (1939); (II) ' The Birds,' by W. S. Medlicott, in Vol. XV (1941); (III) ' The Flowering Plants and Ferns,' by R. J. Flintoff, in Vol. XVI (1941) and XVII (1942). Reference should also be made to Baker's *North Yorkshire*, and Elgees' *Moorlands of North-Eastern Yorkshire*.

The Next Meeting is at Tanfield, July 10th, 1954.

CIRCULAR No. 543

Yorkshire Naturalists' Union.

President:
Rev. T. BASIL KITCHEN, F.R.E.S., Howden.

Hon. Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Hon. Treasurer:
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

Divisional Secretary:
C. M. ROB, F.L.S., Catton, Thirsk.

The 543rd Meeting

WILL BE HELD AT

TANFIELD

V.C. 65

On Saturday, JULY 10th, 1954

HEADQUARTERS.—The Bull Hotel, West Tanfield, Mrs. Hall. Tea with sandwiches 2/3.

MAP.—Sheet 91, Ordnance Survey, New Popular Edition.

TRANSPORT.—The bus service to Tanfield is poor and there is no Rail service. Ripon can be reached by Bus or Train from all parts.

Outward:

Ripon Bus Station	dep.	9-5 a.m., 12-0 noon.
Tanfield ...	dep.	9-26 a.m., 12-21 p.m.
Nosterfield ...	arr.	12-26 p.m.

Return:

Tanfield ...	dep.	5-53 p.m.
Ripon	arr.	6-14 p.m.

ROUTE.—Meet Headquarters 10-15 a.m. Leave Tanfield by Thornbrough road to old Gravel pits near Railway, then *via* Nosterfield to the disused quarries between there and Well, including the ones at Well Scar which are in full production. Return to Tanfield *via* Binsoe if time permits.

Cars can be used for this round if wished but it is hoped the main party will cover the ground on foot.

Members please note no dogs are allowed.

Tanfield was last visited by the Union in 1935, when a very comprehensive circular was issued. Members are advised to consult this if available. On that occasion the party kept to the bank of the river, this years route is to the less rich area which is likely to be of interest to the botanists but may be less so to other

sections, though the old quarries should provide interesting ground and the Gravel pits are extensive, with a good flora.

GEOLOGY.—J. P. Utley: The major part of the excursion will be on the ridge known as the Well-Pickhill Moraine, this is covered by boulder clay, though but thinly in places. The Sand and Gravel pits on the way to Thornbrough may be from the outwash of Lake Humber. The Magnesian Limestone Quarries between Nesterfield and Well are claimed by Kendall as giving the best exposure of Permian fossils in Yorkshire.

MAMMALIA.—J. P. Utley: It is not expected that a great variety of mammals will be seen. There will probably be just the usual assortment of ' Low Country ' animals. Badgers have been seen in the area on many occasions.

ORNITHOLOGY.—R. Chislett: The district is one of fields and woodlands by the side of the Ure, with other woods scattered over an agricultural countryside. Among the species breeding in the area are Goldfinch, Dipper, Sandpiper, Grey Wagtail, Sand-Martin, Moorhen, five species of Tit and eight of Warbler, Redstart, Pied Flycatcher, Nuthatch, all three Woodpeckers, Heron, Tawney and Little Owl, most of these species and others should be seen.

ENTOMOLOGY.—*The Naturalist* for August, 1935, gives an account of the last meeting held at Tanfield, and members interested are advised to consult this.

FLOWERING PLANTS.—C. M. Rob: Both the Gravel pits and the Quarries have a Calcicole flora. *Vipers bugloss, Blackstonia perfoliata, Campanula glomerata* are plentiful. *Erigeron acris,* not common away from the sea; is abundant near Well. The number of plants in good condition should be large, and the ground covered is likely to be of interest.

MOSSES AND HEPATICS.—Joan Appleyard: *Pottia curvicollum, P. davalliana* and *Phascum curvicollum* are recorded from the old magnesium limestone quarry, and Baker has a record for *Bryum pallescens* near the Yore on magnesium limestone at Tanfield. The genus *Orthotrichum* is well represented by *pallens, tenellum* and *cupulatum* var. *nudum. Hygroamblystygium tenax, H. fluviatile, Grimmia apocarpa* var. *rivularis* and *Cinclidotus fontinaloides* occur on stones by the River Yore. Other records are: *Tetraphis browniana, Tortula marginata, Barbula trifaria, Bryum murale, Thuidium delicatulum, T. hystricosum* and *T. philiberti* var. *pseudotamarisci.* The only hepatic record is for *Pedinophyllum interruptum.*

MEETING.—Tea at Headquarters at 4-30 p.m., followed by a meeting for the presentation of reports. Members are asked to be prompt for tea as the party has to be out of the room before 5-30 p.m.

CIRCULAR No. 544

Yorkshire Naturalists' Union.

President:
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General Secretary:
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Hon. Treasurer:
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

Divisional Secretary:
Miss J. GRAINGER, Wilshaw, Meltham.

The 544th MEETING

WILL BE HELD AT

TODMORDEN

V.C. 63

On Saturday, JULY 17th, 1954

HEADQUARTERS.—Mr. J. Fielden, Queen Hotel, Todmorden. A Tea about 4/6 will be provided for those who write direct to Mr. Fielden, this will be at 6-0 p.m.

TRANSPORT.—Train arrivals from Leeds-Bradford area at Todmorden are: 9-54 a.m.; 10-09 a.m.; 11-44 a.m. There is a buffet on the station from which cups of tea can be obtained. The party will leave after the arrival of the 11-44 a.m. train.

THE DISTRICT.—The area suggested for the excursion lies to the north-west of the town in the Calder drainage area, where the surrounding hills rise sharply from the 400 foot O.D. of the town to 1,300 feet O.D. of Stoodley Pike. To present members of the Union the district appears to be almost unknown, but reference to *The Naturalist* between 1864 and 1867 shows that at that time Todmorden was almost the mainspring of natural history in Yorkshire, one of its Society members, John Nowell, being known through his extensive lists of records of plants, particularly mosses, that others like Miall and Hobkirk have published. He is often referred to in W. Wilson's *Bryologia Britannica* and Dr. Braithwaite's *British Moss Flora.* He was a working man, a hand-loom weaver and Todmorden must be proud of his work.

The following notes have been forwarded by Fred Elliman, 12 Barker Street, Todmorden, who will be pleased to help members who require further information.

GEOLOGY.—The best place to visit is Paul Clough, about three miles by bus from the town centre. A local geologist has promised that he will lead a party here.

BOTANY.—Another party can go to Wickenberry Clough, where the following flowers will be seen in July: Felwort, Cathartic Flax, Devils-bit, Sheep's-bit, Field Scabious, Valerian, Wood Sage, Sneezewort, Enchanter's Nightshade, Frog Orchis, Eyebright, Cross-leaved Heath and Bog Asphodel.

MOSSES.—J. Nowell as Vice-President of the Todmorden Botanical Society gave the following rare mosses at Todmorden in his address see *Nat.*, 1867: *Anodus Donianus* Br. and Sch., one of the smallest mosses on wet shady rocks, Greens Clough, Dules' Gate and Sheddon Clough. *Schistostega osmundacea* at is northern limit. *Atrichum crispum* Sull. first found here in nearly all the rocky moorland streams. *Mnium subglobosum* Br. and Sch. previously overlooked as a var. of *M. punctatum. Hypnum ochraceum* Turn. previously considered a form of *H. palustre.*

ORNITHOLOGY.—We shall have someone to lead this section and the possibilities are: On the Moors: Curlew, Green and Golden Plover, Common Snipe, Dunlins, Merlin, whilst Black-headed gulls occupy an extensive gullery. The Little Owl now nest on several sites. On the uplands: Ring Ousel, Wheatear, Twite. In the cloughs: Dipper and Grey Wagtail. In the woods: Willow-Warbler, Wood Wren, Tree-Pipit, Garden-Warbler, Redstart, Yellowhammer, Green and Greater-Spotted Woodpeckers. Corncrakes have been recorded in upland pastures for the past three seasons.

MEETING to elect new members and to receive reports on the excursion will follow the tea at 6-o p.m. at Headquarters.

The next meeting will be the Fungus Foray at Grassington.

CIRCULAR No. 545

Yorkshire Naturalists' Union.

President:
Rev. T. BASIL KITCHEN, F.R.E.S., Howden.

General Secretary:
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, via Lancaster.

Hon. Treasurer:
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

The Autumn Foray

WILL BE HELD AT

GRASSINGTON

SEPTEMBER 24th to 28th, 1954

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Recorders:

Mr. W. G. BRAMLEY, Pickering.
Miss E. M. BLACKWELL, M.Sc., F.L.S., Kirkburton.
Dr. J. GRAINGER, Ayr.

Secretary: Miss J. GRAINGER, Wilshaw, Meltham, Huddersfield.
Telephone: Meltham 352.

HEADQUARTERS.—Ashfield House, Grassington. Terms 16/6 per day. Members should write to Mrs. Stables at headquarters. There are no single rooms, so will members please be prepared to share as far as possible. If Mrs. Stables cannot provide the accommodation you require, get in touch with the Secretary. Other accommodation is available but at a higher figure.

CHAIRMAN'S ADDRESS.—'Medical Mycology with Special Reference to Great Britain' will be delivered prior to the Annual Meeting.

THE ANNUAL MEETING will take place at approximately 8-30 p.m. on Saturday, September 25th, 1954.

WORKROOM.—There is an adequate workroom at headquarters, which will be available for all members. Members should bring books and microscopes.
In case of any difficulties write to the Secretary, or telephone Meltham 352.

CIRCULAR No. 546

Yorkshire Naturalists' Union.

President:
Rev. T. BASIL KITCHEN, F.R.E.S., Howden.

Acting Secretary:
K. G. PAYNE, Manor Heath, Copmanthorpe, York.

Hon. Treasurer:
J. D. HARTLEY, Esq., Lynton Avenue, Boston Spa, Yorks.

Sectional Meetings, 1954

for consideration of the Annual Reports and to nominate Officers for the Sections and their Committees.

All Members and Associate Members of the Union are eligible to attend.

OCTOBER 2nd.—Leeds Church Institute, Committee Room. The **Geological Section** meet at 2-0 p.m. and the **Freshwater Biological Section** at 3-0 p.m.

OCTOBER 9th.—**The Botanical Section** will meet in the Botanical Department, Leeds University, at 2-30 p.m. Entrance is *via* the Baines Door, from University Road.

After tea there will be an exhibition of specimens, to which members are invited to contribute.

The **Conchological Section** will meet in the Geological Department, Leeds University, at 2-30 p.m.

OCTOBER 23rd.—**The Vertebrate Section** will meet in the St. John's Parish Room, Mark Lane, Leeds 2 (behind Lewis's Ltd.), at 3-15 p.m. and again at 6-0 p.m. Prior to this the Ornithological Division will meet at 2-45 p.m. and the Mammals, Reptiles, Amphibians and Fishes Division at 3-0 p.m. At the evening meeting R. Bramhill will speak on 'Four Feet in a Wood', and John Armitage on 'Bats'. Both lectures will be illustrated by slides.

Will members please note the new meeting place.

The **Entomological Section** will meet in the Committee Room at the Leeds Church Institute, Albion Place, at 2-0 p.m. Please note the change of meeting place. Tea will be available at a small charge; members should bring sandwiches, etc. There will be an exhibition of specimens to which members are asked to contribute. Notes should be sent to the appropriate Recorder in time for inclusion in the reports.

NOVEMBER 6th.—A **Meeting of the Executive** will be held at 3-0 p.m. in the Large Committee Room on the first floor of the Parkinson Building of Leeds University. Entry is *via* the main entrance to the University from Woodhouse Lane.

DECEMBER 4th.—The **Annual Meeting** of the Union will be held in Sheffield.

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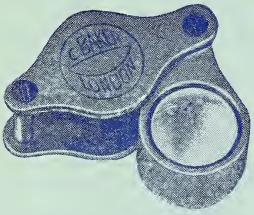

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